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NO. 10

LAKE CARRIERS' ASSOCIATION.

To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interest of Lake Carriers, and improve the character of the service rendered to the public.

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FREE ORE NO ADVANTAGE TO FURNACES.

In a letter on the free ore feature of the Wilson bill the receivers of the Pottstown Iron Co. say: "The placing of iron ore upon the free list gives the pig iron manufacturer an apparent advantage in duties of about \$1.35 per ton, but the proposed reduction on pig iron amounts to over \$5 a ton, the result of which is to make absolutely of no avail the pretended benefits of free ores, whilst at the same time it simply throws away revenues to the extent of over \$500,000 which would otherwise accrue under the present duty of 75 cents per ton on ores.

"What effect the proposed tariff would have on the

pig iron business may be determined when it is considered that under said duty foreign pig can be laid down on almost any of the Atlantic seaboard ports, including duty and ocean freight, at from \$10 to \$10.50 per ton. It means the closing down of the blast furnaces east of the Alleghenies, as well as also all in the Southern section."

HOW TO INCREASE OUR SHIPBUILDING INDUSTRY.

The bulk of the carrying trade of the Atlantic and Pacific is not carried on in ocean greyhounds and doubtless never will be. If the principle, so successfully invoked in the case of the New York and the Paris, is to be of general service to American shipowners and shipbuilders, it must not be restricted by conditions as tonnage and speed which enable only those with the great capital commanded by the International Navigation Company and the Cramps to make use of it. Possibly as a tentative measure the act of 1892 was properly restricted; and certainly the corporation which secured the passage of the measure, and the shipbuilding firm which has developed into a source of profitable employment for labor and capital, deserve credit. They have demonstrated that a more liberal policy toward shipping than that which was adopted in the early years of the republic as the price for the continued maintenance of the institution of slavery does not mean the closing of the American shipyards. The experiment has now been made successfully. It has been shown that the admission of foreign-built vessels to American registry is possible with a simultaneous increase in American construction, and may even contribute to it. To stop with the act of 1892 without carrying it to its logical conclusion by giving it general application and enabling all to share in its benefits, is avowedly to stop short at the grant of a special privilege, to put aside an opportunity to increase the tonnage of the American merchant-marine and the construction of vessels in American shipyards.—*North American Review for March.*

ENGINE POWER FROM LIQUID FUEL.

In a paper read before the Pacific Coast Technical Society, Admiral Jasper Henry Selwyn, a retired British officer, made some surprising statements about the possibilities of engine power derived from liquid fuel. Theoretically, he said, a pound of the best coal is equal to converting 16 pounds of water into steam; but, practically, only half of this effect is realized under the most favorable conditions. But with petroleum there was a theoretical value of 21, and in practice he himself secured the evaporation of 16.9 pounds of water to one of fuel.

This was with oil alone. But by blowing the sprayed oil with steam, instead of air, he claims to have raised the service to 22 or 23 pounds of water. This, he explained, was because the steam was dissociated into its component gases, and the hydrogen thus liberated did duty as fuel. Finally, he declared that under marine and Cornish boilers he was able to burn not only the hydro-carbons of the oil and the hydrogen of the steam, but also the nitrogen gas in the air, which has usually been regarded merely a diluent of the oxygen and a clog on combustion. Thus, he said, he had been able to evaporate 48 pounds of water with one of fuel. In most of his experiments he used, and he recommended that marine engineers always use, an oil of a specific gravity greater than that of salt water, and not emitting gas at a temperature of lower than 360° F.

As is customary in most scientific bodies, when the reading of this paper was finished the subject was dis-

cussed by experts, nearly all of whom were skeptical as to the possibility of attaining any such results as had been described. A gain of from 60 to 80 per cent. in efficiency by substituting oil for coal was all that they were disposed to concede. Moreover, doubt was expressed concerning the availability of a supply of the particular grade of oil prescribed. Most of the residuum produced at the refineries of the United States is burned on the spot; very little gets into the market. Admiral Selwyn was not able to produce the detailed information about his tests that was called for, but he insisted that other men's failures to parallel his alleged success were due to the imperfection of their methods.

LIGHTS FOR BARGES AND CANAL BOATS.

In a circular dated Washington, D. C., February 13, 1894, Inspector General Dumont notifies masters, owners and agents of barges and canal boats that at the regular annual meeting of the Board of Supervising Inspectors of Steam Vessels, held in Washington, D. C., January and February, 1894, the rules for lights on barges and canal boats in tow of steam vessels, prescribed by the Board of Supervising Inspectors at their special session May 10, 1893, as authorized by the Act of Congress approved March 3, 1893 were amended to read as hereinafter printed. The penalty for a violation thereof is \$200:

On the inland rivers, bays, sounds, and harbors of the United States, except on the waters of the Hudson River and its tributaries from Troy to Sandy Hook, the waters of the East River, and Long Island Sound, and the waters entering thereon, and to the Atlantic Ocean, to and including Narragansett Bay, R. I., and tributaries, and Lake Champlain, barges and canal boats towing astern of steam vessels, when towing singly, or what is known as tandem towing, shall each carry a green light on the starboard side and a red light on the port side.

When two or more boats are abreast, the colored lights shall be carried at the outer side of the bows of the outside boats.

Barges or canal boats towing alongside a steam vessel shall, if the deck, deck houses, or cargo of the barge or canal boat be so high above water as to obscure the side lights of the towing steamer, when being towed on the starboard side of the steamer, carry a green light upon the starboard side; and when towed on the port side of the steamer, a red light on the port side of the barge or canal boat; and if there is more than one barge or canal boat abreast, the colored lights shall be displayed from the outer side of the outside barges or canal boats.

These rules shall take effect at sundown, May 1, 1894, and the lights prescribed therein shall thereafter be carried from sunset to sunrise at all times when being navigated.

Provided, That nothing in these rules shall be construed as compelling barges or canal boats in tow of steam vessels, passing through any waters en route or directly to or from a port where lights for barges or canal boats are different from those of the waters whereon such canal boats are usually employed, to change their lights from those required on the waters from which the trip of such barges or canal boats begins or terminates; but should such vessels engage in local employment on waters requiring different lights from those where such canal boats or barges are customarily employed, they shall comply with the local rules where employed.

And it is further provided, That all rules or parts of rules heretofore prescribed by this board in conflict with these rules are hereby repealed.

NEWS AROUND THE LAKES.

CHICAGO, ILL.

Special Correspondence to The Marine Record.

The barge Peshtigo has been sold by W. J. Calhoun to Bay City parties.

H. C. Ralph, of the Inter Lake Transportation Co., was here from Detroit Tuesday.

There has been a new lumber unloaders' union started in Chicago under the name of the "Independent Lumber Unloaders' Union." Michael Lee has been elected president.

Following are the week's charters: Cook, Calbick & Co., the steamer Wm. Morley, B. corn, South Chicago to Buffalo, at 2 3/4 cents. J. G. Keith & Co., the steamer A. A. Parker, corn to Buffalo, at 2 3/4 cents.

The Chicago Vessel Owners' Association held its annual meeting Saturday afternoon at the Board of Trade. The following officers were elected: President, Wiley M. Egan; vice president, Thomas Hood; treasurer, C. W. Elphicke; secretary, F. B. Higgle.

Dr. Hamilton, of the Marine Hospital, chartered the V. O. tug Calumet last week and Dr. Wertenberger of his staff visited and inspected the 323 vessels in winter quarters at this port to ascertain if any cases of small pox existed. He found a clean bill of health and so reported.

The steamer Philip Minch, which was chartered by Capt. John Prindiville in December last and loaded 93,000 bushels of barley for Buffalo at 3 1/4 cents per bushel, is unloading her cargo this week at the Armour A elevator. The shipper will load her with wheat or corn at a freight commensurate with the barley freight.

The Vessel Owners and Vessel Masters held a meeting last Friday afternoon at the hall of the Ship Masters' Association. New by-laws were adopted and directors were elected as follows: Capts. Thomas Clark, J. S. Dunham, James Hogan, Otto Oleson, H. Michelson, Frank Higgle and B. F. Davison. After the meeting adjourned the directors held a session and elected the following officers for the ensuing year: Capts. Thomas Clark, president; Halvor Michelson, vice president; Otto Oleson, treasurer; Frank Higgle, secretary.

Marine underwriters are confronted with a novel situation in that they are receiving a great many applications from vessel owners to insure their hulls for a single trip, whereas heretofore hulls were insured for the entire season. There are 200 vessels loaded with grain lying in the river and the owners of one-fourth of them wish to send their boats to Buffalo, unload their grain, and then tie them up for the season. Such a thing as insuring a hull for one trip was unheard of before, and the underwriters have not determined what they will do about it.

Commander J. J. Brice, late Inspector of the Ninth Light-House District, strongly advocates a new survey of the lakes and the making of new charts. In a letter to Collector John M. Clark he says these are absolutely necessary for the safe navigation of the lakes. The surveying vessels would find plenty of occupation in Lake Michigan alone for some years to come, he says, and the coast survey is well equipped with vessels and appliances for the work and a corps of skilled officers is available for the purpose. Capt. Brice also favors the establishment of marine schools on the lakes. The disasters of the lake region appear to him to be out of all proportion to the action of the elements. One leading cause he finds in the compass, which he says is an uncertain instrument, and is an element of safety only in the hands of a master or navigator who understands its errors and how to find and apply them.

Assistant Secretary Hamlin has written to the collector of customs at Chicago, asking his views on a proposition submitted by the president of the Lake Line Agents' Association, that the commanding officer of the new revenue cutter Calumet be made harbor master "for this port and all its branches." The action of the vessel men was taken in order to have the government, instead of the city of Chicago, regulate the landing and berths of vessels in Chicago river in future. At the suggestion of Secretary Carlisle, the solicitor of the Treasury investigated the legality of the proposition, and decided, that as the federal government had assumed jurisdiction over the Chicago river, the Secretary had the legal right to take the control of the vessels in the river out of the hands of the city. But the Secretary is in some doubt as the advisability of the new move and will possibly act on the advice given by the Chicago collector. The determination of the question will probably be one of the first official acts of the new collector, Mr. Russell.

The tug companies on the Chicago river have succeeded in forming a combination, which will be put in operation at the opening of navigation next month. They have selected Edward Van Dalson as referee and all disputes and complaints will go before him. His power will be autocratic and there will be no appeal

from his decisions. He will be the admiral of a fleet of some sixty boats. Towing charges will be about the same as they were nominally last year, but then there was much rate cutting and towing was done at rates much lower than those prescribed. In the parlance of the river the combination's charges will be 70 per cent. of the tariff for sail and 60 per cent. for steam. The "tariff" is the price paid fifteen or twenty years ago for towing and has been the basis for all subsequent schedules of rates. By the new agreement no tugs will go outside or beyond Grosse Point, off Evanston, for a tow under any circumstances except to prevent shipwreck. The tugs of the same line must be employed to tow out boats as those which towed them into the harbor. No rebates on towing charges can be paid to captains or owners.

BUFFALO, N. Y.

Special Correspondence to The Marine Record.

The negotiations between George A. Lee and the owners of the Sam Marshall tow, looking to an exchange of them for some East Buffalo land, are off.

Considerable new work is being put on the schooner J. C. King and the barge Commodore. The latter is receiving so much new wood that there is expectation of a better rating this season.

The steamer Schuykill had her bottom scraped and painted at Chicago. Charles F. Strasmer, the local superintendent of repairs of the Anchor Line, went to Chicago to superintend the work.

The canal men are not greatly pleased with the five-cent rate made by the roads on wheat from Buffalo to New York, as this is likely to reduce canal rates somewhat below that figure. No grain appears to be offered for canal shipment at present.

The Anchor Line is taking two of the six boilers out of the Susquehanna, and will not replace them at present. All the boats of the line are to be painted black with the old stack and pennant, white arches and cabins and a red line about the hull. It will bring the others into uniformity with the Centurion, which may have been one reason for the change.

William Hingston is building for George M. Swan and others a wooden hull, 50 feet long, 13 feet beam, 6 1/2 feet depth, to receive the engine and boiler of the tug T. H. Fulton. She will be called Hudson. For the same parties he is building a wooden hull 42 feet long, 11 feet beam, 5 1/2 feet depth, for the engine of the tug Post Boy. She will be called by that name. Riter Bros. are building the boiler.

Plans have been prepared for the construction of a new bridge, 200 feet long, across Buffalo Creek, at the foot of Commercial street. It is about the widest place in Buffalo Creek. The bridge will be 22 feet wide, and will not be used for railroad purposes. It will be an iron swing bridge, and will cost about \$40,000. A large petition asking for its construction, was presented to the common council Monday night.

Hingston & Sons are building for Capt. David Hayen a wooden hull 45 feet long, 11 feet beam, 5 1/2 feet depth, to receive the engine and boiler of tug C. A. Shaw, and to be called by that name. These boats are all for the White Star Line of tugs. For Cottier & Shriver Line the same firm are building a wooden hull 40 feet long, 10 feet beam, 5 1/2 feet depth, to receive engine and boiler of tug Gillson, also a wooden tug for the Hingston & Woods' Dredging Co., 56 feet long, 14 feet beam, 7 feet depth. Whitman & Co. are furnishing the machinery, and the Kingsford Iron Works, of Oswego, the boiler. For M. Maher, of Erie, Pa., they are building a wooden fish tug 60 feet long, 13 feet beam, 6 feet depth. Sutton Bros. furnish the engine, and the Bay State Iron Works, of Erie, Pa., the boiler.

A canvass of the local coal situation shows that there is fully 400,000 tons in stock here, nearly all of which is held by three interests. The situation in the West is not favorable to a very brisk early movement, for there is a large amount of coal on the docks that is not sold. Chicago is the worst off. So far it has been impossible to get the vessels unloaded that were chartered to hold their loads last fall. Duluth and Superior are next to Chicago in the coal on hand, while Milwaukee, on account of the failure of Benjamin and other local disturbances, did not load up badly enough to put her in very bad shape. The trouble is mainly with soft coal, which has been a drug all winter on account of the stoppage of so many factories. Prices were not held up as they have been here, and so the situation is anything but satisfactory from an Eastern point of view.

A very important canal bill was introduced in both Houses of the State Legislature last Thursday. It proposes to improve certain canals of the State through the issue of \$12,000,000 worth of 4 per cent. bonds on the plan by which Gov. Dewitt Clinton built the canal in 1825. The bill provides that the proposition to issue these bonds shall be submitted to the people of the state and voted upon at the next election. The plan is to expend \$4,000,000 each year until the canals are in shape to

compete with the great Canadian waterways. If the people vote this fall in favor of the project, the comptroller is directed to issue the bonds, payable in New York City semi-annually. Work is to begin within three months after the first issue of bonds, and all work is to be done by contract, no contract amounting to more than \$350,000, and not more than 85 per cent. of the amount of the contract to be paid to the contractor until after the work is finished. The Erie and Oswego canals are to be deepened to a depth of 9 feet, either by raising the banks or bottoming out. Short locks are to be lengthened and necessary machinery for operating the locks furnished.

DETROIT, MICH.

Special Correspondence to The Marine Record.

The tug Saginaw is being refitted by her owners, the Isaac Watts Wrecking Co.

At Marine City Capt. Julius Baker has purchased the schooner H. C. Winslow from Capt. A. Doerfling on private terms. The Winslow carries about 330,000 feet of lumber.

Social affairs are bothering the members of the Citizens' Yachting Association more than the wild waves these days, and the regatta committee has been hauled out to give the carnival committee a chance to remove the small debt remaining on the furnishings of the house. The committee are getting everything ready for the masquerade at the Auditorium on March 29, and it promises to be the greatest event in the history of the club. The large building is to be artistically decorated with yachting flags, and a committee is now selecting prizes for the maskers. The issuing of stock certificates by the club is having a wholesome effect and is making delinquents pay up. After April 1 memberships in arrears will be forfeited.

There have been some slight changes made in the dimensions of the new McElroy boat, which is to run between Detroit and Port Huron and which is now building in the St. Clair river. The correct dimensions are: Length, 175 feet; beam over guards, 24 feet; depth of hold amidship, 11 feet. Engine quadruple expansion; 15, 22 1/4, 30 and 42 by 18 inches stroke, guaranteed to run 300 revolutions per minute without injury. Two boilers of Ward's torpedo boat style with water tubes, 9 1/2 feet wide, 9 feet long and 8 feet high each, 225 pounds of steam to be allowed. Engine and boilers to be capable of developing 1,200 horse power with natural draft, and 1,500 horse power with forced draft. Either forced or induced draft will be used. The boat will be fitted out for carrying 500 passengers. There will be a standing keel to protect the wheel and give the boat increased stability. The engine and boilers will be entirely below the main deck and as close to the bottom as practicable.

Preparations for the opening of the Great Northern steamship line's business are being pushed forward as quickly as possible, General Agent Moreland being determined that everything will be in ship shape at the opening of navigation. Ed. W. Bissell has been appointed to have charge of the dock and warehouse, but all business of the line will be transacted at the general agent's office, No. 156 Jefferson avenue, where a ticket office will soon be established with everything required for the transaction of passenger and freight business. A waiting-room, ticket office and baggage room will be established at the foot of First street, all under Mr. Moreland's charge. The fleet which will use this dock includes the two exclusively passenger steamships and the six fast freighters. The promotion of Mr. Moreland from the position of traveling passenger agent to that of general agent for Michigan is considered a good move by railroad and business men, among whom he is well and favorably known.

The collision case of the schooner Spalding against the steamer Fedora, has been submitted before Judge Swan in the district court. The collision happened near Fort Gratiot in the St. Clair river in the fall of 1892. The schooner was coming down with the rapid current, and the Fedora going up the stream. When the two vessels came together, nearly head on, the schooner's forward rigging was carried away and considerable damage done. Counsel for the Spalding claimed that under maritime law a vessel which collides with another is bound to wait and see how badly the other is injured, render any needed assistance and furnish information if requested, about its own name, owners, port of hail, destination, etc. As the Fedora ignored this rule and steamed off without waiting to see how badly the Spalding was injured, the Spalding's counsel thought the steamer should be obliged to justify itself in court before the schooner put in its evidence. Judge Swan, however, decided that the rule applied only to the high seas, and was not binding in the St. Clair river, where help could easily be obtained.

The first division of the Michigan State Naval Brigade (naval reserve) was mustered into service for three years at the Russell House Wednesday evening, Feb. 28. The officers are: Chas. C. Poe, lieutenant commanding; Gil-

bert Wildes, lieutenant junior grade; Fred D. Standish and William Howie Muir, ensigns. Strathearn Hendrie, who had been appointed paymaster by the governor, administered the oath of allegiance. Lieut.-Commander Poe has appointed a committee, Dr. Brodie, C. M. Campbell and F. S. Werneken, to take up the subject of civil organization. A regular naval uniform will be worn and the division drilled the same as man-o'-war's men. Each member was assessed \$4, and the amount will be placed in the hands of the state adjutant general for the printing of the necessary stationery, as the state is not yet prepared with funds for the purpose. The uniforms will be made on contract and it is expected that such as are needed can be furnished for \$6 each. Necessary rifles, cutlasses, etc., will be supplied by the general government to be used in practice, and the division will petition Congress for the use of the warship Michigan for practice four days next summer.

CLEVELAND, O.

A. A. Parker, of Detroit, was in the city Tuesday. The steamer Yuma is in the Ship Owners' dry dock receiving bottom repairs.

The new fire tug is nearly ready for launching. The event will occur some time next week.

The Cleveland Dry Dock Co. is repairing a dredge and scow and fixing them up for next season's work.

The offices of Manager Daniel McLeod, of the Inland Lloyds, will be in Room 3, Atwater building.

The new tug building by the Standard Contracting Co. at the head of the old river bed is nearly all in frame.

The Cleveland Ship Building Co. is putting new high-pressure cylinders into the steamers George Spencer and Charlemagne Tower.

Mr. Russell, of the firm of Russell & Watson, Buffalo, ship chandlers, was in Cleveland Tuesday. He reports business unusually brisk for the time of year.

A meeting of the Board of Managers of the Lake Carriers' Association is to be held this afternoon in the offices of President James Corrigan in the Perry-Payne building.

L. P. & J. A. Smith are rebuilding the tug S. S. Stone, and putting three feet more side on her. They are also rebuilding one of their dredges, and are raising her side three feet.

Mr. John Thomson, of River street, who does considerable marine brass work, has been awarded the contract for furnishing the railing for the interior of the Cuyahoga Soldiers' and Sailors' Monument.

Sinclair Stuart, of the Inland Lloyds, is due in Cleveland to-day, to look after the construction of the big passenger steamers North West and North Land, which are being built under the inspection of the United States Standard Register of Shipping.

The Cleveland Saw Mill and Lumber Co. have a contract with government officials to furnish 200,000 of pine timber twelve inches square for Ashtabula Harbor. It is the supposition that this timber is to be used to rebuild the old west government pier from the water line up.

General manager T. F. Newman, of the Cleveland & Buffalo Transit Co., says that the State of Ohio and State of New York will be placed in commission about April 1, or as soon thereafter as the ice at the foot of Lake Erie will permit them to run. The transportation charge has been reduced from \$3 to \$2.50 for this season.

A well-known vessel man said yesterday that he did not believe as much ore had gone in at 80 cents from the head of Lake Superior as had been reported. From his investigations he was convinced that a large number of vessel owners had ore in sight from mining firms with whom they had been dealing for some time, with the arrangement that they were to get what the other did.

Mr. C. B. Calder, late superintendent engineer of the Hanna fleet, who has gone to Detroit to take the superintendency of the engine works of the Detroit Dry Dock Co., is greatly missed in local vessel circles. Mr. Calder is the type of a progressive man, and his ability to make himself almost indispensable in every position he has filled for several years back, is sufficient guarantee that he will be as great a success where he has gone.

The Cleveland Yacht Club adopted, Wednesday evening, in a general way the plans for its new club house, which were drawn by Architect J. M. Richardson, though a few minor changes were suggested which may yet be acted upon. The house will be situated on piles in the lake about 150 feet from Erie street. It will be a three-story wooden building, 88 by 74 feet, and of a composite style of architecture known as the "boat-house style." A veranda ten feet wide will be extended on three sides of the second floor. The entrance will be made on this floor and will be reached by a bridge over 200 feet long, which will be on a level with the Lake shore Railway tracks. The first floor, or "dinghy" floor, will be used exclusively for the storing of small boats and yachting accoutrements. On the second floor will be the janitor's living rooms, ladies' room, and

cloak, billiard and card rooms, while one large apartment will be used as a library, director's room, and general office. The upper story will be used for a general assembly hall, the floor space being 48 by 88 feet. The club expects to have the house ready for occupancy early in the summer. The contract for the superstructure will be awarded within two or three weeks and then the building will be pushed to completion.

MARINE CITY.

Special Correspondence to The Marine Record.

The barge Grace Whitney is receiving a new stem, fender strake and other minor repairs.

Phin Kinyon has completed the work of re-building the dumpscows of the Rooney Dredge Co.

Capt. Henry Lester is replacing the old heavy schooner spars of the Emma L. Coyne with lighter ones.

The barge Fostoria is receiving a new stem, new rail and some minor repairs. Gary & Co. are doing the work.

The rebuild of the barge India is approaching completion. When the work is finished she will be as good as ever.

Capt. Charles Recor has a force of men at work on the barge Alice Richards. She will be given a thorough re-calking.

The owners of the barge Jane Ralston are making some repairs on her, consisting of new decking, calking and minor repairs.

Navigation opened at this port Monday, March 5, 1894, after being closed twenty-nine days. This is fourteen days earlier than last season.

Engineer W. F. Sauber, last season in the Minnesota Liner Masaba, will run Mitchell & Co's steamer W. H. Gratwick No. 2 the coming season.

Capt. William Tomlin has been appointed to the command of the steamer Lizzie Madden. Capt. Tomlin has been in command of the Sa ina the past three seasons.

Engineer Charles Burns, who was in the Neosho last season, will run the new steamer Santa Maria, in which he is interested, the coming season. His brother David succeeds him in the Neosho.

The Holland estate will place a force of men aboard of their large vessel, the John M. Hutchinson, and she will be given some necessary repairs. The Hutchinson was in ordinary at this port all of last season.

The work of steel strapping the new schooner building at Anderson's yard for the Mills Transportation Co., is completed and work was begun Monday on the outside planking. She will be ready for the season's business and will tow behind the Gogebic.

Joseph Morris has been appointed dock agent at the Marine City Stave Co.'s dock. The Star Line, Red Star Line, Grummond's Mackinac Line, McElroy's Detroit and Port Huron Line, Thompson's Detroit and Oscoda Line, the D. & C. Line, the River Line steamer Mary and the steamer Sanilac, of Marron's Cleveland and Saginaw Line, will land at this dock the coming season.

The new steamer Mohegan is about completed. Julius Lorinson fitted and set up her rigging last week. She is of 1,300 tonnage, rates A1 and will be a first-class lumber steamer in every respect. Her capacity is estimated at 1,300,000 feet of lumber or 1,900 tons of coal. Capt. W. M. Hagan, last season in the Miami, will have command of her. She will tow the new barge Mingo and will trade to Lake Superior.

The ice which blocked the St. Clair river at this port began moving at an early hour Monday morning. The barges Keepsake and G. W. Wesley, which broke adrift in the gale and snow storm of February 9 and were lodged in the ice just off the Stave Co.'s dock, dropped in alongside of the dock without suffering any further damage. The Omer D. Conger came down from Port Huron and took the Wesley in tow for that port, where she will be docked. A survey will be held and the exact amount of her damages ascertained. She will be repaired at that port. The Keepsake is but slightly damaged. Capt. J. C. Miller had her removed to Anderson's shipyard, where she will be repaired.

The steamer Mary arrived on her first trip of the season Monday evening. She has been entirely refitted and presents a very handsome appearance. She is now under the management of Capt. S. H. Burnham, who has commanded her the past ten years, and it is expected that she will retain her old popularity, as she is the fastest boat now on the rivers. The Mary will make but one trip daily between Algonac and Port Huron until June 1, when she will make a noonday trip connecting at Algonac with the new McElroy steamer for Detroit. This will be an improvement, as the people of this port will now have bi-hourly communication with Detroit during the season of navigation.

COLLINGWOOD, ONT.

Special Correspondence to The Marine Record.

Harbor Master Lockerbie is circulating a petition to memorialize the Dominion Government to remove the lone rock abreast of the Dummy Light House.

Capt. Scott, of Kingston, will command Smith & Keighley's steel steamer Campana. Capt. Scott has been in charge of the steamer Persia for nearly sixteen years.

A report is in circulation that there are a number of ship carpenters in Owen Sound who are being paid by the council to prevent their removal to Collingwood. There cannot be many as they have nearly all removed to the shipyards where some business is being done.

As spring approaches the wharves are more active than ever. Every marine man who owns any floating property is busy, some in repairing the hulls of their craft, while others are engaged in putting in new engines and boilers.

The tug Charlton, owned by the Saginaw Towing Co., will be practically a new hull when turned out of the dry dock this spring. The timbers from the boilers forward are all new, while the after part is being overhauled, every trace of rot being extracted. The planking was finished on Monday. In a few days the boilers will be placed, when the engineers will begin their work. Mr. Lind, of Saginaw, is here looking after the interests of his company.

The Dry Dock Co. have a gang of men at work on the tug for Messrs. J. & C. Noble. The keel was laid last week and the frames are now set. Planking will be well under way before this week is ended. The boiler for this boat, the dimensions of which are 11 feet 6 inches by 9 feet 6 inches, is in the yard.

Capt. George Playlet, who will walk the quarter deck of the steamer City of London, arrived in town a few days ago, accompanied by his bride.

The U. S. Navigation Co.'s steamer City of Midland, which has been in the dry dock since the close of navigation in 1893 undergoing a change in the form of being lengthened thirty feet, is again ready to float. The additional length gives the steamer a much better appearance outside, while the interior is greatly improved. The cabin is longer and with the advantages offered by a crown roof is hard to equal. The work of connecting her engines will be commenced inside of the next two weeks.

The steamer Favorite, of the U. S. Line, has been improved during the winter at the town wharf. Her cabins have been widened, the staterooms being set out to the rail from stem to stern.

The tugs in the dry dock will be ready for the opening of navigation. To the east of the dry dock, on the G. T. R. property, the lately organized Superior Fish Co. are building their ice house and freezer. The dimensions of each are 60 by 48 feet. Mr. R. Burdett has the contract for the construction of both buildings.

Mr. Alfred Morrill, the veteran shipbuilder, is running a shipyard of his own of no small pretensions on the Block A, west of the Collingwood dry dock. Mr. Morrill has two tugs on the stocks and two more contracted for. His latest contracts are a tug for Mr. Thomas Driver, of this town, and one for Mr. J. W. Needler, of Little Current. The former will be 58 feet in length over all, with 13 feet beam. Her engines will be steeple compound, dimensions 7½ and 12 inches 10 inches stroke. The latter will be 57 feet long over all, with 47 feet keel, 13 feet beam and 5 feet depth of hold. Her engines are 10 by 12 inches and will be allowed 95 pounds of steam.

The G. N. Transit Co. have a large number of men employed in repairing and overhauling their fleet. The engineer's department in each vessel is being looked after by the man who will handle the throttle. As General Manager Cameron is not yet home from California we cannot give all the information we should like.

AN IMMENSE NEW ATLANTIC LINER.

Mr. H. Maitland Kersey, general agent of the White Star Line, announces that his company contemplates the construction of a magnificent new passenger steamer, about 640 feet in length, or 39 feet longer than the Campana. The company is now negotiating with the New York dock board for better facilities. The company will proceed as soon as it is assured possession of two new piers which are to be constructed between West Tenth and Twenty-third streets.

NOTES OF THE MINES.

The Ohio Mining Co., has brought suit against James Sheridan, John B. Weimer, Nettie Weimer and the Ohio Iron Co., to cancel a lease on the plaintiff's mine held by defendants Weimer and Sheridan and assigned to the Ohio Iron Co. The non-payment of royalties amounting to \$97,500 is alleged.

It is reported on good authority that the men at the Chandler mine at Ely have had their wages advanced 25 cents per day. It is learned that the management of the Mesaba Mountain property intends to mine and ship 400,000 tons of ore this season, and that 500 men will be given steady employment as soon as navigation opens.

THE COMMERCE OF CANADA.

The trade and navigation returns showing the extent of Canadian commerce for 1893 have been issued in the usual blue book form. The value of the imports last year amounted to \$129,074,268, and of exports to \$118,564,352. The value of their aggregate trade reached a total of \$247,638,620, the largest in the history of the Dominion. It was \$6,269,177 in excess of the aggregate trade of the previous year, which was then the highest on record. The imports for home consumption in 1893 amounted to \$121,705,030, as against \$116,978,943 in the preceding year, an increase of \$4,726,087. The total imports have been exceeded but once since confederation, viz., in 1883, while those for home consumption have been exceeded three times, in 1883, 1874 and 1873.

The large increases were in imports from Great Britain and the United States, the increase in free goods from the latter country having been upward of \$6,000,000. The total value of imports from the United States was \$45,061,968, an increase of \$1,092,931; from Great Britain \$43,310,577, increase \$1,665,438; France, \$2,847,095, increase, \$397,893; British West Indies, \$1,166,008, increase \$124,621; Dutch East Indies, \$444,474; increase, \$596,770.

The increase in the exports of Canadian produce, amounting to \$6,456,332, occurred principally in shipments to Great Britain, United States, Newfoundland, Belgium and Argentina, the increased exports to the United States and the Argentine Republic consisting very largely of forest products. Comparing the total export of 1893 with previous years, it is noticeable that there was an increase of \$2,276,397 which was all in articles of Canadian production, the decline in foreign goods having amounted to \$4,179,935.

During the past year 27,547 vessels entered and cleared at Canadian ports, as against 30,961 in 1892, and 31,321 in 1891. The total tonnage, however, was but slightly less than that of 1892, which was the highest in the history of the Dominion. Last year's tonnage was 10,608,611. There is this gratifying feature about the navigation returns, that the registered tonnage of both British and Canadian shipping was higher than in any previous year, with the exception of 1887; the tonnage of the British vessels last year amounted to 3,780,915, and of Canadian, 2,189,925. Undoubtedly there is a growing tendency towards the construction of larger vessels. The total tonnage of vessels arrived at and departed from Canadian ports on inland waters amounted to 7,930,923, the number of vessels being 35,634, an increase of 1,300 vessels.

The total coasting trade of Canada last year amounted to a tonnage of 24,579,123. Of this large total Ontario is credited with 9,829,834 tons, the largest in her history. Quebec and Nova Scotia half a million each, the figures respectively being 4,433,796 and 4,390,852. New Brunswick totaled 1,083,134; British Columbia, 3,630,833, and P. E. Island, 1,198,538.

There was an increase of 35 in the number of vessels built last year, but a decrease in the tonnage of 5,800 tons. The average selling price has declined from \$37 per ton in 1868, to about \$11.50 per ton in 1893. The actual number of vessels built in Canada was 313, and of Canadian vessels sold, 42.

DECK-HOUSES ON STEAMERS.

The following letter to the *American Shipbuilder*, while referring chiefly to ocean-going steamships, contains many points of practical value on the lakes:

"The mysterious disappearance of many iron and steel ocean vessels may probably be accounted for by careful investigation of the accident of the steamship *Normannia* the resulting condition of the ship, and the cause thereof. The most superficial inspection of the *Normannia*, upon her recent arrival in New York, after the accident to which so much public notice has been attracted, should direct the attention of shipbuilders and ship-owners to the inherent weakness of the construction of the deck-house, upon and against which the huge wave which was encountered hurled hundreds of tons of water. The almost perfectly square forward wall of the deck-house presented obviously the very worst possible form in which a surface of iron could be presented to the terrific force of the mass of moving water, as described by the officers of the ship, which struck the forward end of the superstructure of the *Normannia*. If the forward ends of deck-houses followed the conformation of the hull of the vessel itself, it would present to the force of engulfing water of a huge wave that form which experience has demonstrated in shipbuilding passes most easily and speedily through water, i. e. elliptical or pointed triangular. A vessel moving at the rate of ten or twenty knots an hour, if struck squarely by a huge wave, glides through the mass of water, as far as hull is concerned, harmlessly as did the *Normannia* recently, and as did the steamship *Paris* a short time ago, but when the square wall of the deck-house comes in contact with the volume of water moving in an opposite direction at terrific speed, the deckhouse will be demolished invariably unless constructed as to

form, manner and material with extraordinary care. Upon an examination of the countersunk rivets which held the walls of the deckhouse of the *Normannia* together and fastened the same to the deck of the ship, it will be observed that while not a single hole in the iron plates has been torn out, (and there are hundreds of such holes in the plates) that every rivet has been cut through or sheared in two as smoothly as if done by a cutting machine for the purpose. Not a plate is torn; the inherent structural weakness of the *Normannia*'s deckhouse, aside from the form thereof, began and ended with the fastening of the plates, which was made by rivets of only one-half inch diameter. If the use of rivets is to be permitted for structural work of this kind they should be of that form of rivets the sides of which are parallel instead of taper shaped rivets as were used in fastening together the plates of iron on the *Normannia*. It is, however, in the light of the most modern and advanced practice, that bolts should have been used for this purpose instead of rivets. Small wonder it is therefore that the rivets were sheared in two by the edges of the holes in the plates when pressed inward by the tremendous force of the wave encountered. Had the *Normannia* been under less control or less ably officered and manned when she plunged her bow into that enormous wave, the mass and weight of water pouring down into the hold of the vessel through the demolished deckhouse might have prevented her lifting her bow again out of the water and another mysterious disappearance would have been recorded of a magnificent steamship carrying hundreds of valuable lives."

STANDARD SUPPLEMENT.

The United States Standard Register of Shipping has just issued Supplement No. 2, dated March 1, 1894. This gives a class to twenty-five lake steamers, including the *Castalia*, *Joliet*, *La Salle*, *Manola*, *Marina*, *Mariposa*, *Mariska*, *Maritana*, *Maruba*, *Masaba*, *Matoa*, *Wawatam*, *Centurion*, *George J. Gould*, *North Land*, *North West*, and whalebacks Nos. 130, 131, 133 and 134, besides the unnamed steel steamer just begun at the Globe shipyard in Cleveland and the three wooden steamers and one schooner building at Capt. Davidson's yard, West Bay City. While the Association has classed the steamers of the Lehigh Valley Co., the Davidson boats are the first wooden vessels to be built under their classification. Accompanying the supplement are partial plans of a wooden lake vessel to class 100 in the Standard Register, the dimensions being 320 by 41 by 26 feet.

LESSONS OF THE KEARSARGE WRECK.

In the statements of survivors of the wrecked U. S. S. *Kearsarge* several matters are noticeable which constitute lessons of advantage for the equipment of other ships. The officers and men are unanimous, for one thing, that the fact of having a catamaran or life raft on board was the means of the safety of all. The boats would have gone to pieces before the crew could have been all landed. Yet it was a curious thing that the *Kearsarge* was the only ship of the navy which carried such a thing, as they had been banished by government orders from all the others. Commander Heyerman is quoted as saying that the ease and speed with which the men were rescued by the catamaran will, he thinks, be the means of ordering this most valuable craft back upon all the other ships, and it is to be hoped that this lesson will be profited from without delay. There is certainly nothing so handy, so serviceable and so absolutely safe as a life raft such as can now be procured from many American manufacturers.

It is also stated by the executive officer that "the anchors were on the bows, secured for sea, and could not have been let go in time to save her, even had they been in complete readiness"—another case of the disadvantage of the old style anchor which has to be catted every time a ship goes to sea and takes some time to get ready for letting go, whereas the stockless anchor, such as is now being generally adopted, is hove right up into the hawsepipe and is always ready for use.—*Marine Journal*.

There is considerable agitation in Leeds for the construction of a ship canal from that town to the Humber. The matter was first broached at a dinner of engineers held in Leeds in 1883, when Mr. W. L. Jackson, M. P., advocated the scheme. The late Mr. D. Adamson (chairman of the Manchester Ship Canal) was present at the dinner, and said it was plain to him they could not have heavy goods carried cheaply until they had ship canals. He added that near Leeds was one of the finest coal fields in the country. East of Shireoaks, to the east of the Permians from Doncaster, and east of the Permians coming to Leeds from York, were mineral resources beyond conception. There was now more coal untouched in those dips than was to be found in the whole of the South Durham coal field. With a ship canal to bring the ore, iron might be made in this district as cheaply as any part of the world. The subject is under the consideration of local capitalists.

MARITIME LAW.

REED et al. v. THE J. J. DRISCOLL, THE H. B. RAWSON and THE CONCHO.

District Court, S. D. New York. October 30, 1893.

COLLISION—STEAM VESSELS MEETING—TIDE—PROPER SIDE OF CHANNEL—LOOKOUT.—A steamer rounding the Battery into the East river collided with a schooner in tow of a tug on a hawser about 150 feet long. The tow was going out with the ebb tide, and making slow progress. The tug saw the steamer and her course in season to have kept away more to the north side of the channel, which she did not attempt to do until a few minutes before the collision. The steamer did not keep a proper watch on the tow and its movements, though both were visible in season, and hence did not avoid the latter by porting, as she could easily have done. Held, that both were in fault.

Brown, District Judge. About 1 p. m. of March 1, 1893, as the steamship *Concho*, coming in from sea, was rounding Governor's island, and proceeding up the East river in the ebb tide, she came in collision with the libellant's large four-masted schooner, *William Johnson*, bound down the East river, in tow of the tug *Driscoll*, on a hawser about 150 feet long. The stem of the steamer struck the schooner's port side, not far from amidships, at an angle of from five to six points, doing damage for which the above libel was filed.

As between the *Driscoll* and the *Concho*, the testimony is extremely conflicting, both as to the place where, and the manner in which, the collision occurred. Upon the whole evidence, I am satisfied that the collision took place after the *Concho* had completely rounded Governor's island, and got headed up the East river; and that it was about in mid-river, and on a line between pier 2 and Governor's island.

In behalf of the *Concho* it is contended that the collision was brought about from the lack of power in the *Driscoll*; so that the master of the *Concho* was misled as to the tow's rate of motion, and did not succeed in getting astern of her, as he had shaped his course and expected to do; that the tug and tow, though heading towards the New York shore, did not draw away from before the *Concho*, as was expected; but drifted down upon the *Concho* with the ebb tide; and further, that the tug did not make seasonable efforts to keep out of the way. The time of the collision was about two hours before the end of the ebb current, which must therefore, have been running at the rate of about two knots per hour.

It is doubtful whether towing a heavy tow with so slight power ought to be held reasonable and prudent navigation in the tides of the East river. It is unnecessary, however, to consider that point here. For the fact of her slow progress through the water must have been known to the tug; and in broad day it must also have been apparent to the steamship, had any careful attention been given to the tug and the schooner. Timely observation and proper maneuvering in reference to the apparent facts, were equally incumbent upon both the tug and the steamer. I think both are to blame for not taking more timely and efficient measures to avoid each other. To the *Driscoll*, it was evident that the *Concho* was bound up the East river. Her course lay to the southward of the *Driscoll*. The *Driscoll* must have been nearly half a mile distant when the *Concho* was seen rounding Governor's island. The *Driscoll* was somewhat in the proper water of the *Concho*, as I find that she did not get to the north of mid-river at the time of collision. She should have hauled over to starboard more quickly and effectually than she did; so as to get into the water where she claims to have been but where I am obliged to find she was not. She did not attempt to get more to the northward until a few minutes before collision.

The *Concho*, on the other hand, did not keep a proper watch on the tug and tow. No report of them was made by the lookout; and though seen from the bridge early enough, it is plain not much attention could have been given to their movements, until they were quite near. There was abundant unobstructed room for the *Concho* to the right; and had the tow been observed, and had the *Concho* ported in time, so as to pass to starboard by a reasonable margin, as she could easily have done, the collision would have been avoided; it would also have been avoided by reversing sooner, which was equally in her power.

Cassier's Magazine for March contains the usual large number of articles of interest, including an able paper on "Large Search Light Projectors," by H. M. Norris, Jr., Am. Soc. M. E.; "Anti-Friction Materials," by Killingworth Hedges, M. Inst. C. E., and a letter to the editor on "Experiments with Mechanical Power in the Erie Canal," from Wm. H. Odell, M. Am. Soc. M. E. Among the many handsome illustrations is a view of the great electric traveling crane, with 80 feet span, in use and on exhibition in the Machinery Building at the World's Fair, and constructed by the Morgan Engineering Co., Alliance, O.

SUBDIVISION OF STEAMSHIPS AND SAFETY IN CASE OF INJURY.

BY ANDREW HAM.

If the skin of a ship is penetrated below water, by a collision, ramming, explosion of torpedo, etc., she may founder by:

(1) The loss of her reserve buoyancy, sending the vessel straight down to the bottom.

(2) The loss of her stability, making her capsize.

Usually only the first cause is considered, although probably many a ship was lost by the combination of the two causes, as, for instance, the *Victoria*. The word "reserve buoyancy" means the buoyancy which the water-tight inclosed parts above the water plane can give. It is the weight of a quantity of water, equal in volume to the difference of the total cubical contents of the ship up to the upper deck and the cubical displacement. It is obvious that a vessel must ship a weight equal to the reserve buoyancy before it sinks. Now, in a ship which has no subdivision, the water has free access to all its parts and, consequently, will flood it till its surface is on a level with the surface of the sea. This is, for instance, the case with wooden vessels carrying lumber, some of which are so old and leaky as to be totally unfit for any other trade.

Steel steamships, however, are of too heavy a material to float on any kind of cargo, and to protect them from sinking, the only resource we have is to localize the effects of the injury by subdividing them by means of water-tight bulkheads. Naturally these bulkheads are placed athwartships, but in addition to these longitudinal bulkheads may be fitted. Later on we will see that these may become elements of danger instead of safeguards. Water-tight subdivision is no new invention. Chinese junks were built with bulkheads centuries ago. H. B. M. S. *Etna* and *Terror*, wooden sailing ships, were built with bulkheads as early as 1830, and effectively prevented the 'Terror' from sinking when damaged. When steam was introduced as motive power, the necessity of separating the machinery from the cargo-holds created two bulkheads amidships. In addition to these a collision bulkhead near the stern was fitted, so that the early steamers had at least three bulkheads, dividing them into four compartments. Lloyds register committee in 1855 prescribed two engine-room bulkheads, and one at each end of the vessel. Since then, as the size of the ships increased and their construction was improved, the number of bulkheads required became larger and more stringent rules for their construction were laid down. At present Lloyds requires a collision bulkhead, a corresponding one near the stern, engine-room bulkheads and one in the fore hold for vessels over 280 feet long; one in both the fore and aft holds in vessels over 330 feet long. The question of subdivision has been thoroughly investigated by the bulkheads committee appointed by the board of trade, which brought out its report in 1891. It classifies ships in six grades and requires a division in compartments, such that the ship keeps afloat under certain conditions, different for each grade. The first grade comprises all passenger ships over 425 feet long, and, because of the danger in crossing the track of so many other steamers, all channel steamers, irrespective of their length. They must be able to keep afloat with any two of the compartments filled, necessitating in general eight bulkheads.

It is of the highest importance to calculate in an early stage of a ship's design the probable effect of any injury done to the ship. In these calculations we always suppose the ship to receive the damage at one of the bulkheads, so that the two adjacent compartments are flooded, this being the worst possible case. Further, the compartments are not supposed empty but filled with cargo. Therefore, to get the weight of water admitted, a certain percentage is deducted from the weight of water which the empty compartment would ship. Coal for instance, admits 40 cubic feet of water for every 100 cubic feet of space occupied. Similar deductions are made for engine and boiler space. This deduction for cargo spaces is justified by the fact that they are only empty when the ship has no cargo at all, for no captain will load his ship with a heavy cargo in all except one or two holds, and leave those empty. And when a ship is in light condition she is in general safe enough.

Generally speaking, long ships are a little safer than short ships; ships with fine water lines somewhat safer than those with full lines. Shallow ships are decidedly safer than deep-going ships, and a ship with V-formed sections will be safer than a ship with full or U-formed sections. It is to be observed that draft and depth in hold should not be mixed up. The greater the depth in hold with the same draft, the greater are freeboard and reserve buoyancy and the safer the ship is. As before stated, an allowance is made in the calculations for the buoyancy which the cargo gives. But there are other considerations, other factors of safety, or rather, factors of danger, which we can not express in figures.

The vital parts of the ship are its machinery and the

steering apparatus, which latter is under these circumstances of even greater importance than the propelling machinery. This, however, is generally safe, protected as it is by the overhanging upper works at the after end. The chief advantage of twin-screw ships is found in the possibility of navigating with one engine and propeller when the other one is disabled. This requires a longitudinal bulkhead which should be fitted in all twin-screw steamers, and should be extra strong. The loss of the *Victoria*, however, has shown the danger of capsizing to which a ship may be exposed by having too much of a good thing in this regard.

In an ordinary large liner the angle of heel caused by the filling of one engine-room will not exceed 15° probably. But, to counteract this, we would have to fill the water-bottom on the emerging side, which would only partly right the ship, and, on the other hand, sink her deeper. Coal might be shifted, but that is neither easily or quickly done. So that, for the time being, the ship is in an awkward condition. The water pounds against the bulkhead with every roll and may wreck it. If the water be confined to the engine-room the danger is not so imminent, but if the boiler-room should be flooded, too, and have a longitudinal bulkhead, it may be a serious case. Fitting longitudinal bulkheads in both engine and boiler-rooms, therefore, is inadvisable. And even where large side bunkers are situated alongside the boiler compartments, it may be well to connect them by a trimming pipe, which may be below the fire-room floor, so that the bunkers on both sides shall become flooded. The bulkhead committee considers a ship unsafe when the deck at the lower side is about three-hundredths of the depth of the ship above the water surface.

Flooding of boiler rooms means loss of motive-power entirely, and for that reason in large liners two boiler-rooms are necessary, and it is desirable that the arrangement should be such that (say) a couple of single-ended boilers should be put in a third compartment, which may be smaller.

The main steam pipes, running from the forward boilers to the engine, receiving on their way the steam from the after boilers, deserve a little attention, too. They should be inclosed in a separate trunk, running from the forward boiler compartment through the after one. Valves in the branch pipes to the separate boilers should be situated in or near this trunk and should be made so that they may be manipulated from the upper or main deck. The advantage of this arrangement is obvious. For suppose one compartment flooded and the steam pipes immersed, I think they would form an undesirable condensing apparatus, as ordinary coating is inadequate against the great cooling effect of water. And, if we could not readily at all times shut off an immersed boiler from the main pipe, this boiler would act as a powerful condenser, too.

Next we have to consider the donkey-boiler, on which all the auxiliary machinery depends when the main boilers are powerless. Instead of placing it low down in the ship, it should be put on the main deck and inclosed; or, if placed below, it should be given a separate room, accessible from above by a water-tight trunk.

Finally, no doors should be cut in bulkheads unless absolutely necessary. In the *Columbia*, of the Hamburg-American line, no doors below the water-line are cut in any bulkhead; in the *Lucania* only a very few which were considered absolutely necessary. Although this gives a lot of trouble to the engineers, it is necessary for safety; for water-tight doors, in perfect working condition when new, after a while get rusty, dusty or jammed up, and in fact I am afraid that on many a ship they can not be worked at all. Also, should they work all right in ordinary condition, they might refuse to do so when a strong water-pressure is on one side. The transverse stability of a ship is considerably changed by the flooding of compartments.

RE-ENFORCING STEAM PIPES WITH WIRE.

The interesting fact is noted in *Engineering* of the adoption in the Italian navy of the plan of re-enforcing steam pipes with wire, the practice consisting in serving the tubes over with one or more layers of closely laid metal wire, wound on under tension; up to about eight inches in diameter, drawn tubes are used without re-enforcement, while above this diameter the tubes are made out of copper sheets by the usual brazing operation and are then wrapped around with a close spiral of copper or delta metal wire. This method of re-enforcement is only considered applicable to straight tubes, and, accordingly, these only are used, gun-metal castings being employed at the elbows and bends. The wire is of sufficient section to carry the full steam pressure independently of the strength of the tube, though the latter is made strong enough to stand the usual hydraulic test before the wire is put on. The re-enforcement is made up with two or three independent spirals, so that if one wire breaks the tube is still held up to its work by the others. The ends are fixed independent of the flanges.

HOW TO DISTINGUISH IRON FROM STEEL.

The simplest way is to pour on the metal to be tested a drop of nitric acid; let it act for one minute, then rinse with water. On iron the acid will cause a grayish white; on steel a black stain. Steel may be distinguished further from either cast or wrought iron by the closeness of the grain, its toughness and its having that peculiar property called temper, which is the power of hardening when suddenly cooled after being red hot. If a bar of steel be made of a bright red heat and is then suddenly plunged into cold water, it will be found to have become harder than any other metal—so hard, indeed, that it will scratch glass, and is as brittle and readily broken as flint. If, says an exchange, a piece of hard, bright steel is held for a moment in the hollow of a clear fire, a pale straw color appears on the surface; its hardness is slightly lessened and it is fit for razors, surgical instruments, etc.; if held in the fire for a moment or two longer it becomes of a bright golden yellow, and is fit for pen knives and other cutting instruments; held longer still, it becomes bright blue and is fit for watch springs, swords and other purposes requiring great elasticity; if the heat be carried still farther a brown tinge is seen, and it is now rather soft, but still greatly harder than iron and still elastic; saws, coach springs and other articles are made from steel at this temper. If the heat be carried to redness the steel will be quite soft when it has slowly cooled, but if suddenly cooled (as by being plunged into water) the original hard temper comes back again. The most curious manufacture in steel is that of lace, which was made several years ago, looking as fine as any Brussels lace, and said to be equally soft to the touch.—*Mechanical News*.

HOW THE OCEAN IS KEPT FULL.

Always an interesting problem to puzzle over is where all the water comes from. An expert has recently compiled statistics showing that the average hourly quantity of water discharged into the sea by some of the best known rivers of the world is as follows, the figures representing millions of cubic feet of water per hour: Amazon, 3,700; La Plata, 3,100; Mississippi, 2,070; Volga, 1,120; Danube, 960; Ganges, 700; Nile, 560; Rhine, 230; Elbe, 100; Seine, 80; Thames, 40. The next question is, where does the water in the rivers come from? When that is answered by the statement that it comes from the hills, we have gone about as far as we can go. Water is an element, and what its original source may be no man knows. Of course, we can say that it is a combination of two gases, hydrogen and nitrogen, but why it is so and why they keep combining in just about the same proportions continually, is a little beyond our ken.

How rapidly water moves down such a river as the Mississippi, however, has been computed. It was found that a wave would run from Cairo to New Orleans in about eleven and a quarter days, covering the distance as follows: From Cairo to Memphis in 2½ days; from Memphis to Helena, 1½ days; Helena to Vicksburg, ¾ days; Vicksburg to Bayou Sara, nearly 3 days; and from Bayou Sara to New Orleans over 1 day. This is a distance of 965 miles, so that the average rate of the current would be nearly four miles per hour. On the Red river of the South again the rate of the current is considerably less than three miles per hour, it having been calculated that from Arthur City, Texas, to Alexandria, La., a distance of 683 miles, the rate of river travel averages as follows: From Arthur City to Fulton, about 1¼ days; Fulton to Shreveport, nearly 3 days; Shreveport to Coshatta, nearly 3 days, and Coshatta to Alexandria, about 2 days, or a total of nearly 10 days between Arthur City and Alexandria, or 14 days between Arthur City and New Orleans.

TO BUILD A GUNBOAT AT PITTSBURG.

In the matter of enterprise in furthering the aims and objects of their corps, the naval militia have established a reputation for their service ever since its inception; but Division A, Second Battalion of the Pennsylvania corps, situated at Pittsburg, has certainly taken the lead in this line by determining to supply its own needs in the line of a vessel especially adapted for its purposes at a cost of \$40,000. The battalion have already raised about one-third of this amount, and, with assurances of help from the iron, steel and coal men of the place, besides expected State assistance, they consider the project certain of success. The vessel will be a light-draft, steel-clad, stern-wheel craft, with the wheel recessed and protected, and the vessel especially designed throughout for service in the shallow waters thereabout. She will be 160 feet long, 30 feet beam, draft 2 feet 9 inches forward and 3½ feet aft; fitted with compound condensing engines, to be equipped with a 6-inch breech-loading rifle and three smaller rapid-fire guns, with accommodations for one hundred men. The contract for this private gunboat has been awarded to James Reese & Sons, Pittsburg, and she is expected to be ready for use next summer. The federal government will be asked to loan at least part of the armament.

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As we go to press we are glad to state that the tariff bill has been reported back to the Senate by the Finance Committee, with an amendment fixing the duty on iron ore at forty cents per ton.

THE enterprising Japs now appear as the latest claimants for possession of the fastest sea-going vessel in the world, saying that their latest addition—the Yoshino—can “lick” anything in the U. S. Navy. The Yoshino is 350 feet long and 46½ feet broad, and is said to have attained on her trials a mean speed of 21.6 knots with natural draught and 23.031 knots, or 26.57 statute miles per hour, with forced draught. This is as against our Columbia’s 22 knots and now it remains with us to go them one better. In this progressive age no one is allowed to remain at the top for very long.

Seaboard, New York, in its issue of March 1, takes up ‘steen columns of its space in arguing that it is unjust to Americans for a London company to even print a list of iron and steel lake steamers. The assumption is that because the list is to be included in a book of registration that lake vessels will have to be classed in Lloyd’s Register of British and Foreign Shipping, a work practically unknown on the lakes. As a representative journal of the marine interests of the United States we would be pleased to see lake tonnage included in all the shipping registers of the world.

THE Light-House Board, or its secretary, has taken time by the forelock this season and announces the exhibition of district lights beginning March 15. The Inspectors of the Light-House Districts, who, by the way are naval officers, have no doubt had their recommendations well attended to this year. Electric lights placed only a quarter of a mile apart denote the highest point of efficiency in lighting narrow, well used waterways. This system is now being arranged by Commander W. M. Mead, U. S. N., Inspector of the Eleventh Light-House District and the Board will be asked to sanction and adopt the plan for the sixteen miles of the Hay Lake Chanel.

THE United States Supervising Inspector General of Steamboats missed the chance of his life in not sending the full corps of local inspectors of steamboats on the lakes on to Brooklyn, N. Y., to learn how wreck courts of inquiry are carried on. The present inquiry on the loss of the Kearsarge would have taught these men how to go about the formation of a court, how, when and wherefore certain questions and quibbles should be put so as to incriminate the witnesses when under cross-examination. It is deplorable that such an opportunity should be missed; the inquiry is probably now nearly over and a similar case for the enlightenment of novices may never occur again.

THE wave of alleged public opinion against the premiums offered on contracts for war vessels for certain excesses of speed above the limit required in the contract, has died as quickly as it was born. The whole excitement was stirred up in a pitiful spirit of demagoguery, and an intelligent public, after looking carefully into the matter, has treated the attempt to create a sentiment against the practice with the contempt it so richly deserves. There is, under the provision of law, no plan so well calculated to build up the American ship building industry, and to give it material assistance in a practical way, and further, to encourage a spirit of invention. The premiums were the only just means of offsetting a fine for a degree of speed less than that called for by the contract, and meet the hearty approval of every person whose opinion in these matters is of value.

THAT RONCADOR REEF.

As suggested in our issue of March 1, the naval court of inquiry on the loss of the U. S. S. Kearsarge has traveled along a line of defence which will perhaps tend to mystify the causes which led up to the casualty instead of clearly defining and placing negligence or culpability where found to exist.

In the article referred to we stated that the late officers of the Kearsarge ought to be prepared to offer evidence before the court showing that at the time they were in the vicinity of Roncador Reef there existed “a wonderful system of converging surface currents, powerful contrary under-tows and singularly acting in-draughts,” in conjunction with other agencies, all tending to throw the ship out of her ordinary course.

This hint seems to have been acted upon in a timely manner, for on March 5 an eminent naval officer was brought before the court to testify “that as to Roncador Reef he knew nothing except that the eddy currents near the shore were constant sources of danger. Under-currents played pranks with surface currents, etc.” If thoroughly evidenced, we were willing to take aboard a theory of converging surface currents, powerful contrary under-tows and in-draughts of stupendous velocity settling directly towards the reef during the half-day that the Kearsarge was in that vicinity, but evidence of “eddy currents playing pranks” so as to cause the loss of a man-of-war seems to be in somewhat of too light a strain to accept as reliable expert testimony in so serious a casualty, and we opine that the Kearsarge people will have to do better than that if they desire to mitigate the loss.

Lookouts stationed on topgallant yards all afternoon and up to 5:30 p. m., with orders to scan the horizon broad on the bow, beam, quarter and astern at a time when the reef bore forty, thirty, twenty and ten miles dead ahead argues a sort of a “going under arches and over bridges” style of marine locomotion that when out of sight and hearing of the deck officers must have raised roars of laughter among the crew, for “Jack” is not averse to having his risible faculties touched at any time, and when they went below the topgallant yard lookouts were no doubt unmercifully bantered by their messmates at being perched aloft to report the direction sea gulls winged or the cant shoals of flying fish, etc.—all this of course at the expense of the navigating and executive officers of the ship, who were anxiously looking for what couldn’t be sighted.

The error of distance run and discrepancy in course, if made good, is, however, too much to shoulder off on to the prevailing currents, and perhaps the latter portion of our recent suggestions would prove a more fruitful field of information for the court to delve into. Might not the Kearsarge have been coming along a handful of points, or at least twenty to thirty degrees out of her course on account of a submarine magnetic attraction sufficient to cause a serious aberration in her compasses, and all affected alike? If Roncador Reef can only be made highly magnetic, and the vicinity be found to teem with that invisible power known as local attraction, coupled with, on that day, a singular economy of aerial magnetic disturbances and unheard-of sea currents in velocity and direction, then there were causes enough at work to account for the loss of the ship; otherwise, and after all due allowances had been made for variation, deviation, local attraction, heeling error, currents, leeway, etc., the ship very naturally fetched up where she was pointed for.

In the light of recent events it is not unfair at this time to criticise the action of the officers of the U. S. S. Kearsarge. Nor is there any occasion for the technical public to await the decision of perhaps a long drawn out naval court of inquiry where the result is so palpable. The nation has lost a historical if not a valuable war ship. She was accurately headed and skillfully steered for the beach, where she fetched up in due course all standing. There was no Samoa blundering in this loss, nor should there be any effort at concealment of the true causes which led up to the casualty, for a well grounded belief is wide among seamen that a smartly handled vessel under canvass generally fetches up where she is aimed at, even if it takes a couple of extra tacks to get her there.

We candidly expect that science, commerce and navigation is to be benefitted through the inquiry relative to the involuntary loss of the Kearsarge. It is only occasionally that the chance occurs in the United States for a full or impartial technical investigation of the causes leading up to shipwrecks, foundering or collisions, whether accompanied by loss of life or otherwise; therefore much is expected from the findings of the naval court of inquiry now in session.

The development of the laws of magnetism are known to affect the magnetic needle. Applied intelligently in the mechanical and mental work placed on charts of the latest surveys, with the skillful handling and liberal equipment of the highest classed tonnage, must widely benefit commerce, and the foregoing features are more prominently brought forward in courts of inquiry on maritime casualties than under any other circumstances,

competitive examinations in navigation and seamanship notwithstanding. If then, so much may be developed from the loss of one naval ship, the reasons are furnished for the most inclusive technical investigation being held into the loss of merchant ships; yet, we are all behind the age in not having held such; nor are our present departmental resources competent to deal with this important subject in its entirety.

ARE ENGINEERS TO BECOME SHIPMASTERS?

The associations of marine engineers in England are becoming so widely recognized in successfully prosecuting their aims, that the time is almost now at hand for asserting that the chief engineer of a steamer will soon become the executive officer in charge of the deck as well as of the machinery.

The engineers are organized and make their power felt in matters relating to wages, number of men to attend the engine room, accommodations and their social standing on board ship. Chief engineers ask for and will no doubt eventually obtain full control over the black squad; legislation is also requested to step in and surround the chief engineer with disciplinary authority over the entire engine room force, thus relieving the master of at least a portion of his unpleasant duties.

It is of course understood that there can be but one master on board of a vessel, and, argued from the mechanics’ standpoint this person is more likely to be the engineer officer than that a deck officer should obtain the mechanical or professional knowledge necessary to act in the dual capacity so easily acquired by the man who is already virtually in command of the propelling power. The question at hand for ship-masters, engineers and owners to solve is, could not a steamer be gotten over the ground just as well and more economically by merging the two officers into one, and if so, how soon can the present master be subordinated to engineer’s clerk, deck assistant, sailing master, pilot, chart officer, wheelsman, or whatever term it is thought best to adopt, or is this change first to take place in special trades on the coast and ocean, and if so, how long will it be before its adoption on the lakes.

Marine engineers are becoming better organized, seeking a higher education and courting that ambition which is not likely to stop at half way measures. As soon, therefore, as the intellectual and technical ability of the mechanic or professional marine engineer equals or exceeds the knowledge and skill which ship-masters ordinarily exercise, the latter may step down and out. It is, in this light, not so much a question of the subordination of marine engineers, as it is a recognition of the merits which they in time will possess, fairly entitling them to the highest elevation, and to hold the post of honor and responsibility in the floating machine shops now employed in the nation’s commerce.

This subject is of necessity an interminable one under existing conditions, yet, the foregoing brief elucidation of many argumentative discourses furnishes the sentiment which is gaining universal ascendancy. The marine engineer has a mission to perform, a goal to reach and a destiny to fulfill. Such is the impression, and no cry of “sour grapes” will head him off in this age of steam or throughout any succeeding mechanical propelling power used as a means for marine locomotion. Ship masters, it is said, will shortly have to face the alternative, viz: To rise immeasurably superior to the present requirements and so distance their competitors in the race for scientific skill and practical ability in the execution of their duties, or else be content to abandon position and ship as quartermaster or supercargo under the command of the owners financial agent, the master of the vessel’s mode of propulsion.

The change from sail to steam brought about more radical innovations than those cited in the foregoing, but what the future developments may accomplish is beyond the power of the present generation to even surmise. Yet all who have given the subject the attention it deserves must candidly admit that the engineer officer is looming up as the No. 1 man on “wave churning tanks” and that in certain trades they may even now act as “marine omnibus conductors” without being weighted down with the professional lore of an ancient brass bound admiral.

NO EXCUSE WHATEVER.

The *Army and Navy Journal* says: “The *Marine Journal* is sarcastic at the expense of the ship news reporters of the leading dailies, specifying particularly the *Herald* and *Evening Post*. But one of these papers was compelled, as we chance to know, to choose some years ago between incompetency and dishonesty, and it appears to have determined that the safer refuge is in incompetency.”

This is a case where a poor excuse is decidedly worse than no excuse. Should an instance of dishonesty occur on a leading daily, it should result in embarrassment of this sort for no longer than a few weeks at most. There are certainly men who are capable of filling the post of

ship news reporters who are thoroughly reliable. Certain it is that such botch-work as the green land lubbers on the papers mentioned are guilty of is enough to ruin their reputation as marine news publishers within a very short time. Better to drop the department altogether than to do the work so badly.

THE past four years has witnessed the advent of as many books for the rating, classification and construction of lake built vessels. Previous to that time the Inland Lloyds Register reigned isolated and supreme in its rulings. It is still to the fore, having recently added to its staff an expert on metal construction, etc. The Great Lakes Register, published in Cleveland last year contains the particulars of all iron and steel steamers although not a single vessel is classed rated or valued therein. The society of Lloyds Register of British and Foreign Shipping now intend to print a list of iron and steel lake steamers for the benefit of their subscribers. Evidently the maritime element in the financial hub of the universe has discovered that there is something going on in this vicinity now and again. We may also plead cheerily to the charge of launching well-built and highly finished steel steamers up to nearly five thousand tons carrying ability. Well! we can't get away from our destiny and we have long ago bid good-bye to a narrow, limited, one-man system of transacting ships' business at any stage of the game. From keel to truck in construction, repair and equipment, handling, navigating, managing and owning the lake marine equals and in some features clearly surpasses the best practices known to the universe elsewhere.

THE past week has developed a rather sensational discovery in the way of a lot of nickel steel armor which was defective in that it did not come up to the requirements and specifications. The steel came from the Carnegie mills, and a fine of \$140,484.94 was imposed. No one thought for a minute that the Carnegies had been guilty of any intentional fraud, and public attention was at once drawn to their employees. While their connivance would have been absolutely necessary in the event that their employers had such a fraud in view, on the other hand they might have turned out this inferior grade of work without the knowledge of the Carnegies or any of the higher officials of the company. It is claimed that they have done this, and that the motive for their action lay in the large prizes awarded by the government to the informer, who gets a liberal per centage of the amount of fine in cases in which Uncle Sam's laws are broken. The information came apparently from an outsider, but an investigation is being conducted which will probably bring the whole inside of the conspiracy, if such conspiracy exists, to the light of day. The truth of the matter cannot come out too soon.

ENGINEER officers may be placed in charge of Atlantic liners and even be given command of the ever present "tramp," (that like stormy petrels are) always on the wing picking up stray morsels of comfort in the shape of parcels of freight; but the pilot and ship master must perforce be a distinct official from the engine room artificer, in the lake trade. The same system may be applied *vice versa* with little or no friction, since it is a bad rule that won't work both ways. Ship-owners, however, are prone to hold "to individual responsibility" in the handling of their property, and will, no doubt, exercise this prerogative, according to their astuteness and discretion under all circumstances. If the engineer is for them "the better man," then he will be loaded down with the responsibility and obtain the consequent emoluments of office, as the man the money is placed on; if the master, then present conditions of most trusted employee remain unchanged, and skillful pilotage is considered superior to mechanical efficiency, or each of primal importance in their separate grades of skill.

THE Steamboat Inspection Service is now going in for testing iron and steel plates at the works of the manufacturers. Is there any truth in the rumor and more than suspicion that Carnegie sort of "diddled" the Navy Department, their tests and inspectors into accepting inferior quality metal for the construction of our new navy? Certainly there is not much, if any scientific skill required in the honest testing of a piece of metal, mechanism and a few figures alone "tell the tale," but, where the Navy Department has failed mediocre talent is liable to make worse blunders and assistant local inspectors of steamboats will have to make haste slowly in applying their official test brand on metal plates. Friction with all interests has hitherto been strenuously avoided by steamboat inspectors, this innovation is going to bring some of it about.

The clearances from the port of Kewaunee during the month of February numbered 38, with a total tonnage of 32,667. The clearances for the same month in 1893 were 34, with a tonnage of 32,818.

MANITOWOC.

Special Correspondence to The Marine Record.

At H. B. & J. B. Burger's shipyard the barge Amboy has received new steel arches and steel straps on stringers. The firm are placing the boiler on board the steamer Lawrence, and will do carpenter work around it. The steamer Lotus will receive a new fore and aft compound engine built by the Montague Iron Works. The steamer C. W. Moore will go into dock and receive repairs and a new boiler. The tug Fred Anderson will go on the boxes for considerable repairs. The steamer City of Green Bay will receive repairs. The steamer E. M. B. A. will receive a new cabin and deck and some repairs. The steamer Fannie C. Hart will get a new boiler.

The Goodrich Transportation Co.'s steamers Indiana and City of Racine are receiving the Howden force draught device. The steamer City of Racine has had her boilers overhauled and repaired and given new fire boxes by John Mohr & Sons, Chicago. The steamer Virginia will receive two new wheels of the Howden pattern to increase her speed. All the company's steamers are undergoing repairs and renovating to put them in their usual excellent condition when navigation opens.

The Manitowoc Steam Boiler Works are building a marine boiler 8½ feet diameter and 14 feet long to be allowed 140 pounds steam pressure for the tug Welcome, of Milwaukee; a marine boiler of the same dimensions for the steamer Fannie C. Hart, and two Scotch type boilers 9½ by 12 feet, to be allowed 150 pounds steam pressure for the steamer E. A. Shores, Jr. They have put a new fire box in the boiler of the tug Elmer, of Manistique.

Capt. Thomas Roche is giving the schooner Naiad some new stanchions, stringers and rail, new deck frames, new main and poop decks, new iron davits and a general overhauling.

Capt. Oliver Oberg is giving the schooner Bertha Barnes a new foremast and some repairs.

Seitz Bros. have given the steamer J. H. Johnson a new boiler 5½ by 9 feet, a new engine and boiler house, a new mast and general repairs. Capt. Anton Oleson is giving the scow Success part new deck, new stanchions, plank sheer, covering boards, rail, and a new quarter deck. She was in Burger's dock and received new bilge keelsons and deadwood.

Capt. Ole Oleson is giving the schooner L. B. Coates some new stanchions and plank sheer, some new decks and general repairs and a new square sail yard.

Engineer Joe Webber has built and placed on board his steam yacht Lena a fore and aft compound engine with cylinders 3½ and 7 inches by 6 inches stroke.

Capt. George C. Albrecht, of Manitowoc, died of pneumonia after only a few days illness at Escanaba, on January 13th, aged 37 years. The deceased sailed on the lakes about twenty years. Four years ago he quit sailing and went into the iron ore trimming business at Escanaba. He was widely known and much respected. He leaves a widow and five children.

NOTES FROM ALL PORTS.

The Richelieu and Ontario Navigation Co., have bought a 50 h. p. Robb-Armstrong engine for their electric plant on the S. S. Canada.

The steamer Nebraska has been chartered to the "Soo" Line for the coming season. It is said that to put the Nebraska in shape for the package freight trade will cost about \$6,000.

Edward Pfeister has been appointed light keeper at Conneaut to fill the vacancy caused by the death of Capt. John H. Starkey. A largely signed petition was sent in from Conneaut asking that Mrs. Starkey be appointed to succeed her husband, but it had no weight at Washington.

Official numbers have been assigned by the commissioner of navigation during the past week as follows: side wheel steamer Enos Taylor of Cincinnati, 64.78 gross tons and 64.78 net tonnage, No. 136,422; propeller Pentland, of Grand Haven, Mich., 827.45 gross and 617.78 net tons, No. 150,656.

Edwin R. Seeley, Frederick Dixon and Hamilton Irving commenced an action against the Farwell Transportation Co. at Milwaukee last week to recover \$10,000 damages. The grounds of the action are based on a contract for the sale of the schooner S. B. Pomeroy, which was burned on Lake Ontario, August 3, 1891.

The people of Two Rivers are agitating the matter of making an attempt to get the Goodrich boats to stop at their place this season. The Goodrich folks and the Two Rivers people got into a quarrel some twenty years ago about freight rates since which time the boats of the line religiously avoided even touching at the harbor piers of Two Rivers.

It is stated that the steamer Mary Mills will be taken from her winter quarters at Kewaunee within a few days to Manitowoc, where she will receive new machinery and other repairs fitting her for package freight

between Menominee and Chicago. The Mills with another barge not named will form a tri-weekly line, carrying lumber up and package freight down from Chicago.

A West Superior dispatch says; "The Belt Line Railway, which runs around the city and connects with the dock mills and elevators at the east end, has been sold to the Northwestern Coal Railway Co., which is building the largest coal dock in the world on Alouez Bay, for \$250,000. It is claimed that this is a move by president Hill, of the Great Northern, to make connections with the mills and elevators at the east end."

A special dispatch received last night from West Superior says; "A party of officials of the Lehigh Valley Transportation Co., arrived here to-day and have asked for bids on a new coal dock to handle 175,000 tons, Commodore Henry, of the Lehigh Valley fleet was one of the party, and the eight steel steamers will probably run to the head of the lake this season."

Capt. McDougall has with him in the East the plans of an ocean steamer which may be built and placed on the Atlantic or Pacific. From a gentleman who saw the plans of the boat at Washington it is learned that she is a "whale" in more ways than one and, if built, will be one of the fleetest greyhounds on the deep. She is to be 460 feet long, 47 feet wide and 31 deep and has 10,000 horse power engines. The boat is designed for a flyer and if she is built she will astonish the old ocean passenger steamer builders. The new boat will have on her snout the national bird, an eagle.

If as the result of litigation the Frankfort & South-eastern Railroad should be divorced from the Toledo, Ann Arbor & North Michigan, it is quite likely the latter road will be built to the lake shore at Arcadia, ten miles south. This would mean the transfer of the ferry business to Arcadia, which now possesses fair harbor facilities as a result of the private enterprise of Henry Starke, a former Milwaukeean, who owns the greater portion of the town site. It may turn out that Mr. Starke "built better than he knew" when he decided to have a harbor at Arcadia, even though Uncle Sam did not assist in the matter.

CAN ROLLING BE CHECKED?

The London *Shipping World* gives the following in answer to the above question: It is possible to check rolling, but not without an expenditure of time, money and thought. There are various ways to check it, but each method demands certain sacrifices. That is to say, (1) by building a ship of such proportions as will secure a small metacentric height when in sea-going trim. In our opinion this is possible with large Atlantic passenger steamers, and it is a wonder that builders have not had the courage to do this. A small metacentric height means a somewhat tender ship, but with ample freeboard and great displacement weight this should not matter, and a slow-rolling, steady ship would be the result. (2) By fitting bilge keels. These, though neither adding to nor taking from the ship's stability, assist in bringing her to a state of rest; and the same may be said of side keels. (3) By fitting water chambers across the vessel, as has been done in several men-of-war. (4) By fitting hollow side keels in short lengths for about one-half the vessel's length amidships on both sides. Of these plans, the first is, no doubt, the best, but a tender ship may become by stress of weather unstable.

WHO IS TO COMMAND?

It may be granted that when a steamboat is handled properly it looks an absurdly easy operation. You have only to steer the ship, and when you ring the telegraph the engines work as you wish, and there you are. It is easy when you know how to do it; but when would our engineer friends commence their experiments, and how? At what age and under what circumstances would they commence to acquire that nerve on the bridge of a steamer which nothing but years of practice will give? Or does the engineer passed in navigation propose leaving the control of the ship in the hands of pilots under him? Who are to place the ship where he wants her, and to take charge of her at sea? Would not this last state be worse than the first? The engine room to rule the deck, and then be helpless in the hands of men to whom you are supposed to be able to give orders.

There is no more common or erroneous idea than that which supposes that because masts and yards are becoming things of the past that therefore the need of seamanship has passed away. Masts and yards did not make a seaman. He had to know how to use them to get his ship about, and they were part of his business, as the engine and the propeller or paddle wheel now is. But seamanship is the art of safe navigation, of keeping your ship out of trouble, and doing the right thing at the right time, and no greater mistake can be made than to suppose that because a man is competent to find a ship's position at sea that therefore he is competent to command a steamer.—*Nautical Magazine*.

AMENDED STEAMBOAT REGULATIONS.

Supervising Inspector General Dumont announces in a circular, dated February 19, 1894, that at the regular annual meeting of the Board of Supervising Inspectors of Steam Vessels, held in Washington, D. C., January and February, 1894, in pursuance of Section 4405, Revised Statutes of the United States, amendments were made to various sections of Rules I, II, IV and V. Changes were made in all forms of certificates of inspection, for which inspectors should make requisition previous to their supply of the old forms being exhausted; and, when the new ones are obtained, the changes thereon, which relate to records of donkey boilers, must be interlined in original book of certificates.

Attention is specially directed to changes in Pilot Rules, Lakes and Seaboard, and Western Rivers, as herein printed, and which will be printed in separate circular, and in the pilot rules when new editions of such rules are required to be printed.

These amendments having received the approval of the Secretary of the Treasury, dated Feb. 12 and 13, 1894, have now the force of law, as provided in Section 4405, Revised Statutes, and must be observed accordingly. The following devices were approved by the Board, and have also received the approval of the Secretary of the Treasury, as required by Section 4491, Revised Statutes: Wm. H. Taylor's life-boat; the Hussey life-raft, presented by Glavis & Tingle; D. Kahnweiler & Sons' pressed cork life-preserver; J. M. Coale's pop safety-valve and muffler.

The Board, under the authority conferred upon it by Section 4429, Revised Statutes, approved the following pipe boilers made by the persons and firms whose names follow, when constructed in all their parts of wrought iron, steel, or cast steel, in the manner as provided in the general rules of the Board:

Lewis Saunders, Lawrence, Mass.; Perkins & Richmond, Grand Rapids, Mich.; E. P. Clark, New York, N. Y.; John H. Lutz, Michigan City, Ind.; Henry Haenel, St. Augustine, Fla.; Lee H. Stephens, New Albany, Ind.; I. G. Morgan, Seattle, Wash.; Charles L. Seabury, Nyack, N. Y.; George H. Holmes, Gardiner, Me.; Chas. W. Foster, New Haven, Conn.; Babcock & Wilcox, New York, N. Y.; Anson C. Dearing, Detroit, Mich.; The Rochester Machine Tool Works, Rochester, N. Y.; Hampden Hyde, Rochester, N. Y.; Charles DeVore, Philadelphia, Pa.; Emil Volk, New York, N. Y.; J. B. Jardine, San Francisco, Cal.; B. Louis Toquet, Westport, Conn.; L. Boyer's Sons, New York, N. Y.; J. R. Jackson, McKeesport, Pa.; George W. Arrowsmith, Fort Niagara, N. Y.; George L. Wright, North Andover, Mass.; W. W. Moore, Eugene, Ore.; J. J. Driscoll, Stapleton, N. Y.; Charles Ward, Charleston, W. Va. (coil boiler); Charles Ward, Charleston, W. Va. ("Navy"—horizontal pipe boiler); R. Muroe & Son, Pittsburg, Pa.; Samuel T. Williams, Baltimore, Md.; John A. Flajole, Bay Bity, Mich.; D. Rousseau, New York, N. Y.; The Coulter & McKenzie Machine Co., Bridgeport, Conn.; John J. Brown, Baltimore, Md.; George E. Dow, Seattle, Wash.; L. D. Davis, Erie, Pa.; John A. Duggan, Boston, Mass. ("Christiansen Marine Boiler"); Robert R. Zell & Co., Baltimore, Md.; D. Y. Williams, South Haven, Mich.; E. U. Gibbs, Elmira, N. Y.

The circular prints the text of the paragraphs of sections amended in part only, the parts stricken out being enclosed in brackets [thus], while the amendments to such paragraphs are printed in *italics*. Entirely new sections and paragraphs of sections are in plain type, preceded by the word (new) in parenthesis. The rules for inspection of material are of too great length to be given here. The rules for licensing engineers are as follows:

RULE V.—Section 5. (Second paragraph amended.) *Provided*, That any person who has served as a regular machinist in a marine engine works for a period of not less than three years [not including any time he may have served as an apprentice, may be licensed as an engineer of steam vessels of 100 tons and under, and for inferior grade of license above 100 tons;] and any person who has served for a period of not less than three years as a locomotive engineer, stationary engineer, regular machinist in a locomotive or stationary engine works [apprentice machinist in an engine works], and any person who has graduated as a mechanical engineer from a duly recognized school of technology, may be licensed to serve as engineer on steam vessels after having had not less than one year's experience in the engine department of a steam vessel, which experience must have been obtained within two years preceding the application (which fact must be verified by the certificate in writing of the licensed engineer or master under whom the applicant has served, said certificate to be filed with the application of the candidate), and no person shall receive license as above, except for special license, who is not able to determine the weight necessary to be placed on the lever of a safety valve (the diameter of valve, length of lever, and fulcrum being known) to withstand any given pressure of steam in a

boiler, or who is not able to figure and determine the strain brought on the braces of a boiler with a given pressure of steam, the position and distance apart of braces being known; such knowledge to be determined by an examination in writing and the report of the examination filed with the application in the office of the local inspectors and no engineer, or assistant engineer now holding a license shall have the grade of the same raised without possessing the above qualifications.

Section 14. (New, added to third paragraph.) *Provided, however*, that applicants for original license to act as master or mate of steamers engaged in the Atlantic coast menhaden fisheries shall only be subjected to such examination as shall satisfy the inspectors that the applicant is a competent coast pilot, capable of navigating such fishing steamers.

The resolution in regard to, and changes in, pilot rules, is as follows:

Resolved, That pilots of steam vessels be instructed, through the local inspectors of steam vessels, when licenses are being issued to such pilots, either originals or renewals, that the signals provided in Pilot Rules, Lakes and Seaboard, and Western Rivers, for steamers meeting, passing, or overtaking, are never to be used, except when steamers are in sight of each other, and the course and position of each can be accurately determined—in the daytime by a sight of the vessel itself, or at night by its signal lights.

In fog, mists, or falling snow, when vessels can not see each other, fog signals only may lawfully be given, and pilots should, upon hearing the fog signal of another vessel ahead, or on either bow, run slow, with frequent stoppages, until the fog signals of the opposing vessel are heard abaft the beam.

Be it further resolved, That these resolutions be printed in a foot note on the Pilot Rules when new editions are printed, and also in circular form, to be presented by the local inspectors to each master and pilot when issuing to him his license.

Following are the amendments to pilot rules for Western rivers:

RULE I. When steamers are approaching each other from opposite directions, the signals for passing shall be one blast of the steam whistle to pass to the right, and two blasts of the steam whistle to pass to the left. The pilot on the ascending steamer shall be the first to indicate the side on which he desires to pass; but if the pilot on the descending steamer shall deem it dangerous to take the side indicated by the pilot of the ascending steamer [he shall at once indicate with his steam whistle the side on which he desires to pass, and the pilot of the ascending steamer shall govern himself accordingly, the descending steamer being deemed to have the right of way.], *he shall at once signify that fact by sounding the alarm or danger signal of three or more short blasts of the steam whistle, and it shall be the duty of the pilot of the ascending steamer to answer by a similar signal of three or more blasts of the whistle, after which the pilot of the descending steamer may indicate by his whistle the side on which he desires to pass, and the pilot of the ascending steamer shall govern himself accordingly, the descending steamer being entitled to the right of way.*

But in no case shall pilots on steamers attempt to pass each other until there has been a thorough understanding as to the side each steamer shall take. The signals for passing must be made, answered, and understood before the steamers have arrived at a distance of 800 yards of each other.

RULE II. (New, addition to rule.) Vessels approaching each other from opposite directions are forbidden to use what has become technically known among pilots as "cross signals"—that is, answering one whistle with two, and answering two whistles with one. In all cases, and under all circumstances, when a pilot receiving either of the whistle signals provided in the rules, which for any reason he deems injudicious to comply with, instead of answering it with a cross signal, must at once observe the provisions of this rule.

RULE III. (New, addition to rule.) When two steamers are approaching a bridge span or draw from opposite directions and the passing signals as provided in Rule I, have been given and understood, should the pilot of the descending steamer deem it dangerous for the steamers to pass each other between the piers of such span or draw, he shall sound the alarm or danger signal, and it shall be the duty of the pilot of the ascending steamer to answer with a similar alarm signal, and to slow or stop his engines below such span or draw until the descending steamer shall have passed.

The preceding amendments to Pilot Rules for Western Rivers are to take effect on May 1, 1894, and to appear in the next publication of those rules.

RULE X. (The following words at end of last paragraph of rule are struck out:) [White lights shall also be placed on the extreme side of the tow on either hand and also on the extreme after part of the same.]

NOTES.

THE steam yacht Herald, now lying at New Bedford, will be sent to Red Bank, N. J., for a Roberts boiler, which is now being constructed for her.

THE Clayton Air Compressor Works have removed their offices and salesrooms from No. 43 Dey street to the Havemeyer Building, No. 26 Cortland street, New York.

HARPER's for April will anticipate the next naval battle by describing a supposed duel at sea between two armored cruisers of the first class. The article is written by Lieutenant S. A. Staunton, of the United States Navy, and amply illustrated by Mr. R. F. Zogbaum.

THE International Navigation Co. and the Cramps, who are building the St. Louis and St. Paul, have adopted Serve ribbed tubes for marine boilers. Seventy other steamers in Europe and America are now being fitted with them, according to information furnished by C. W. Whitney, of 81 Fulton street, the New York agent.

THE new officers of the National Association of Marine Engineers are: George P. Wilson, of Philadelphia, past president; George Uhler, of Philadelphia, president; Fred. Nixon, of San Francisco, vice president; Thomas F. Dowd, of Chicago, secretary; John Williams, of New Orleans, treasurer; George W. Rouse, of New York, chaplain; Joseph F. Lance, of Buffalo, conductor; E. F. Lock, of Toledo, door keeper. The convention in 1895 will be held in Washington.

THE Davis Farrar Co., Erie, Pa., manufacturers of engines and boilers, centrifugal pumping machinery, steam yachts, wood tube boring machinery, etc., have recently shipped a large marine outfit to the Styron Transportation Co., Washington, N. C., and two complete phosphate pumping plants to Florida. They have also closed contracts for two large triple expansion marine outfits for Texas. They report business fairly good with gratifying increase in inquiries.

THE business of the Magnolia Metal Co., in its sales of Magnolia metal, has increased 12 per cent. from January 1893 to January 1894, over the sales of the previous year, notwithstanding one of the greatest panics that the world has ever seen, passed over the country during that time. The factory of this company has never closed down for one day on account of the panic, and a part of the time it had to run all night in order to keep up to the company's orders for Magnolia metal. The outlook for the coming year of 1894 is very bright, and the company anticipates an increase of at least 50 per cent over the year 1893.

THE Roberts Safety Water Tube Boiler Co., of Red Bank, N. J., and 18 Cortlandt street, New York, are building a boiler for Messrs. G. E. and C. A. Painter, of the Pittsburg Iron Works, for the new steel steam yacht which they are constructing to make 25 miles per hour. The boiler will carry 250 pounds of steam. Messrs. Painter Bros. are the owners of the Gwendoline, which has had a Roberts boiler for the past three years and which has several times attained a speed of between 19 and 20 miles per hour. The Gwendoline is only about 50 feet long, but is the fastest boat on the Ohio, Monongahela and Allegheny rivers. Her boiler has been forced with the best soft coal and exhaust in the stack for the past three seasons, and has never developed any weakness or defect even with the muddy river water which is used in it.

OFFICIALS of the Michigan Central and Grand Trunk and Mr. Gould, chief engineer of the Detroit water works, the other day visited the works of the Detroit Graphite Manufacturing Co., for the purpose of inspecting the boiler, but more particularly the flues. A year ago several of the flues were given a coating of the graphite paint manufactured on the premises. It was condemned at this time by an expert, who said that it would destroy the flues in six months. The fact has not borne out his prediction. When they were examined a few days ago they were found in as perfect condition as when painted. The other flues, which had not been touched with the graphite, were badly corroded and scaled. The painted flues, on the other hand, had a clean and almost polished surface, to which it seems impossible for anything to adhere. The paint is said to be entirely fire-proof and to be a conductor of heat.

Nor only a pretty, but a valuable custom, and one which should be enforced by law all over the land, is that of having the national ensign over all school houses. There is no more valuable object lesson in patriotism than this, and the flag should be regularly raised every morning the school is in session and lowered at night. Placing the care of it in the hands of a guard of the largest scholars, relieved on duty by others from time to time, would tend to increase the wholesome sentiment among the youth of the land and cause them to take an interest in the teachers' explanations of the meaning of the flag and the reasons why Americans should always be proud to do it honor. Another way in which this healthful interest might be stimulated would be by having the flag set at half-mast whenever there was a death among the membership of the school, thereby invoking a sense of personal attachment to the colors.—*New York Marine Journal.*

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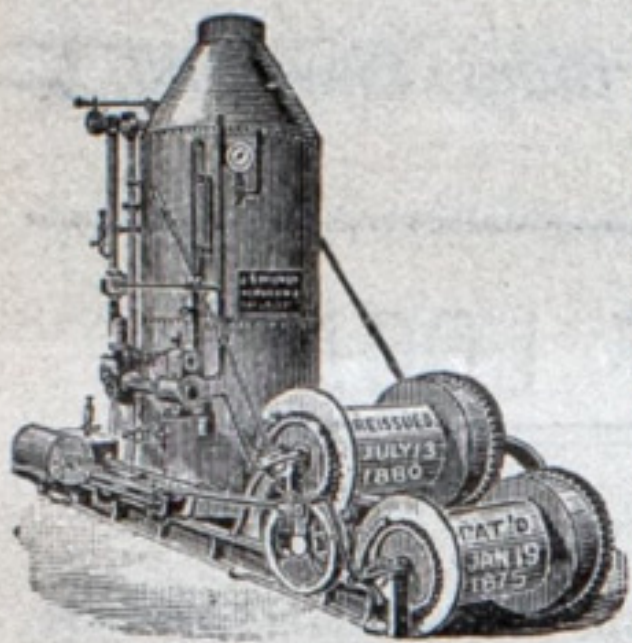
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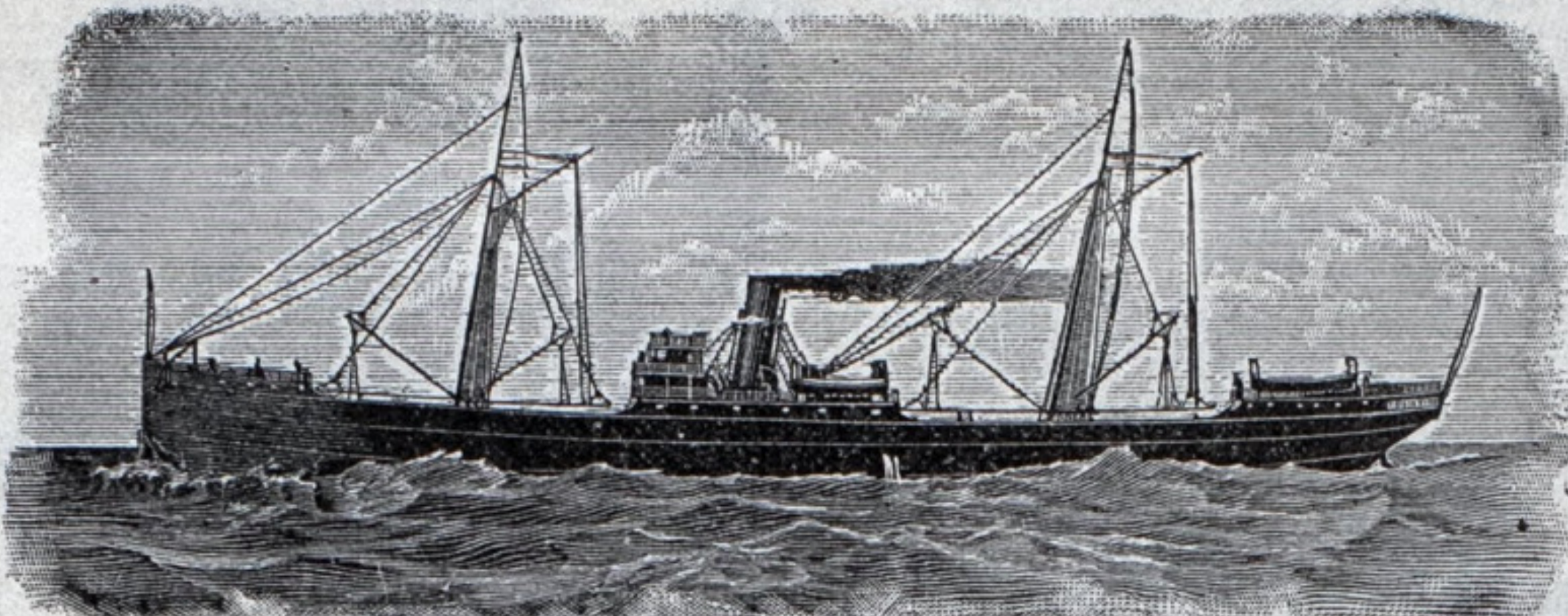
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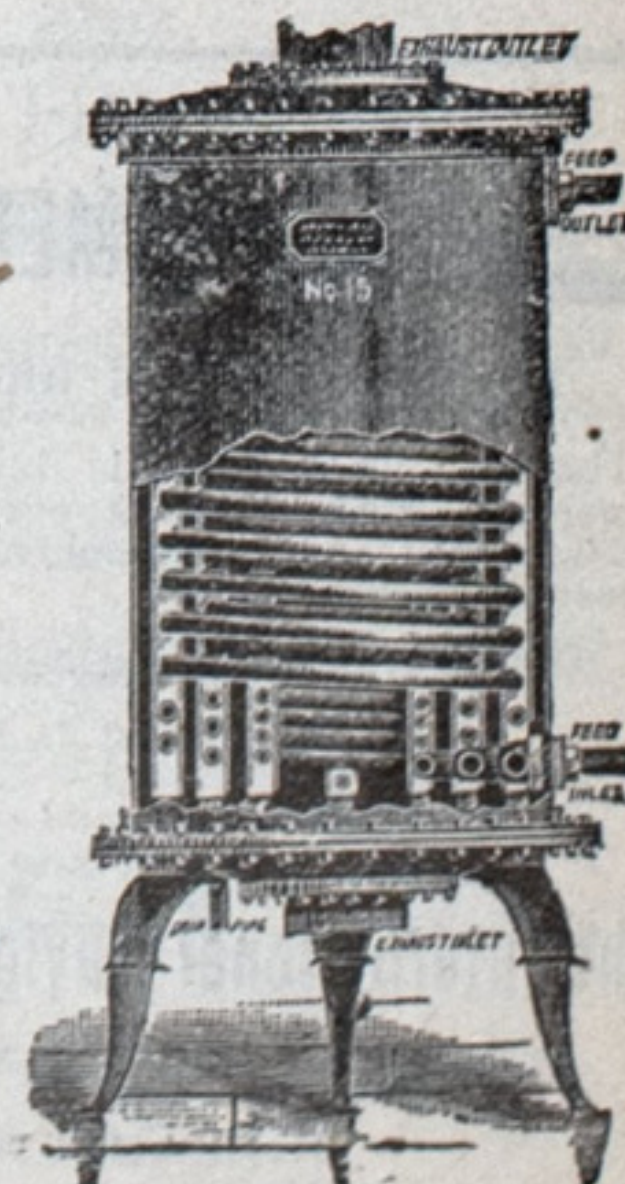
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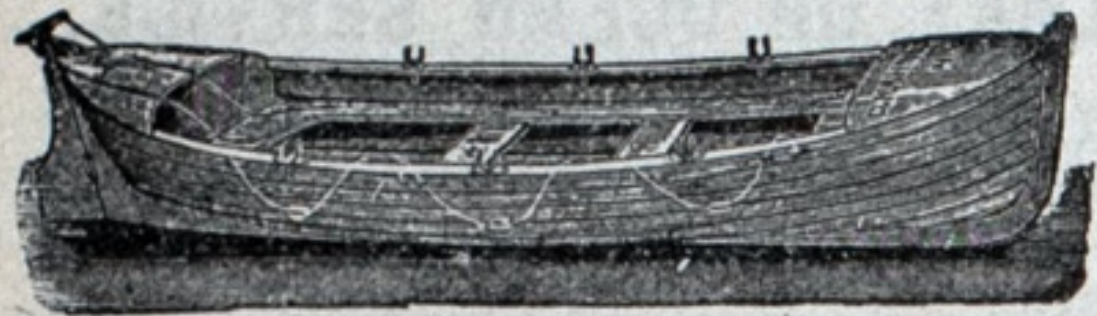
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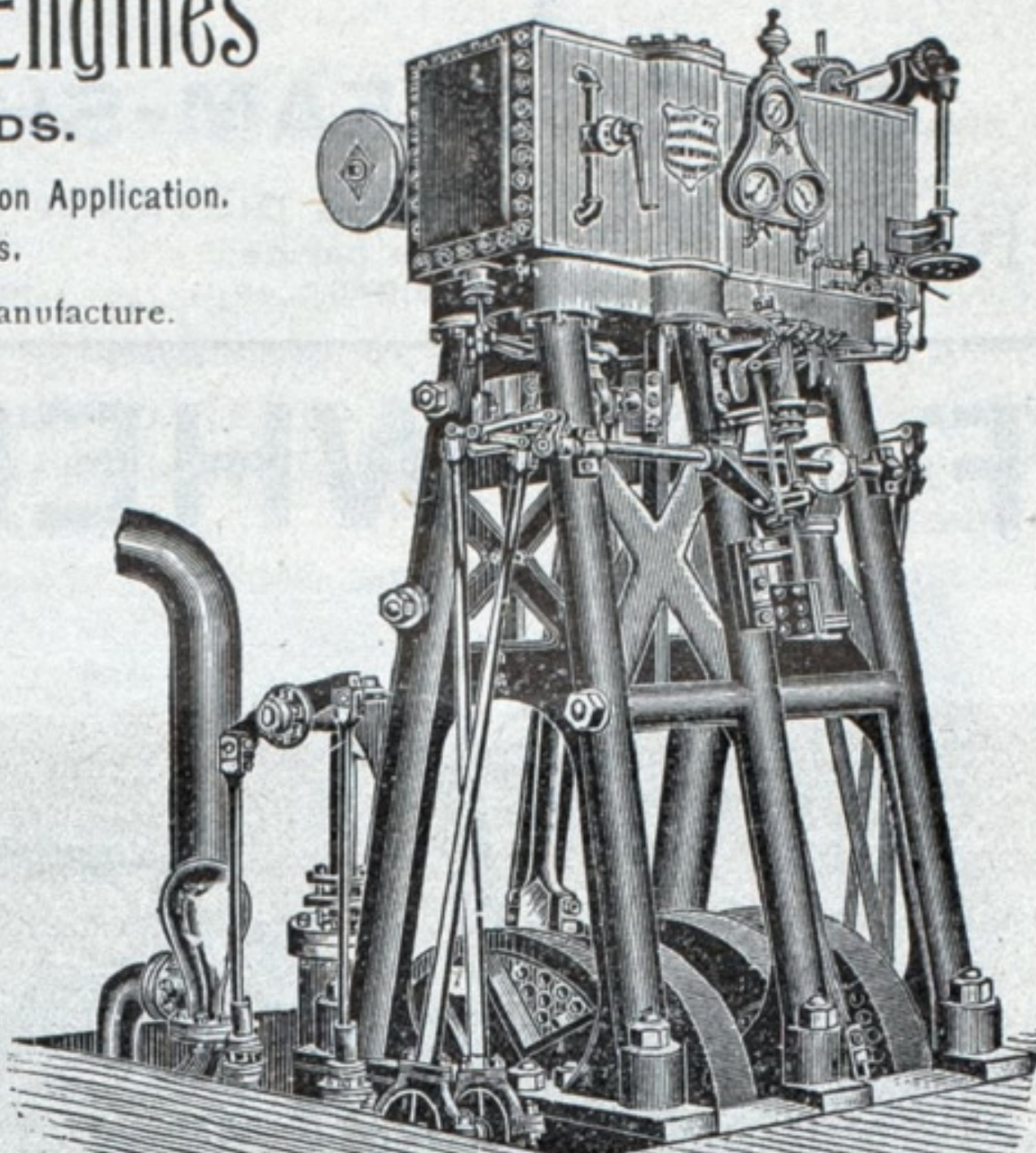
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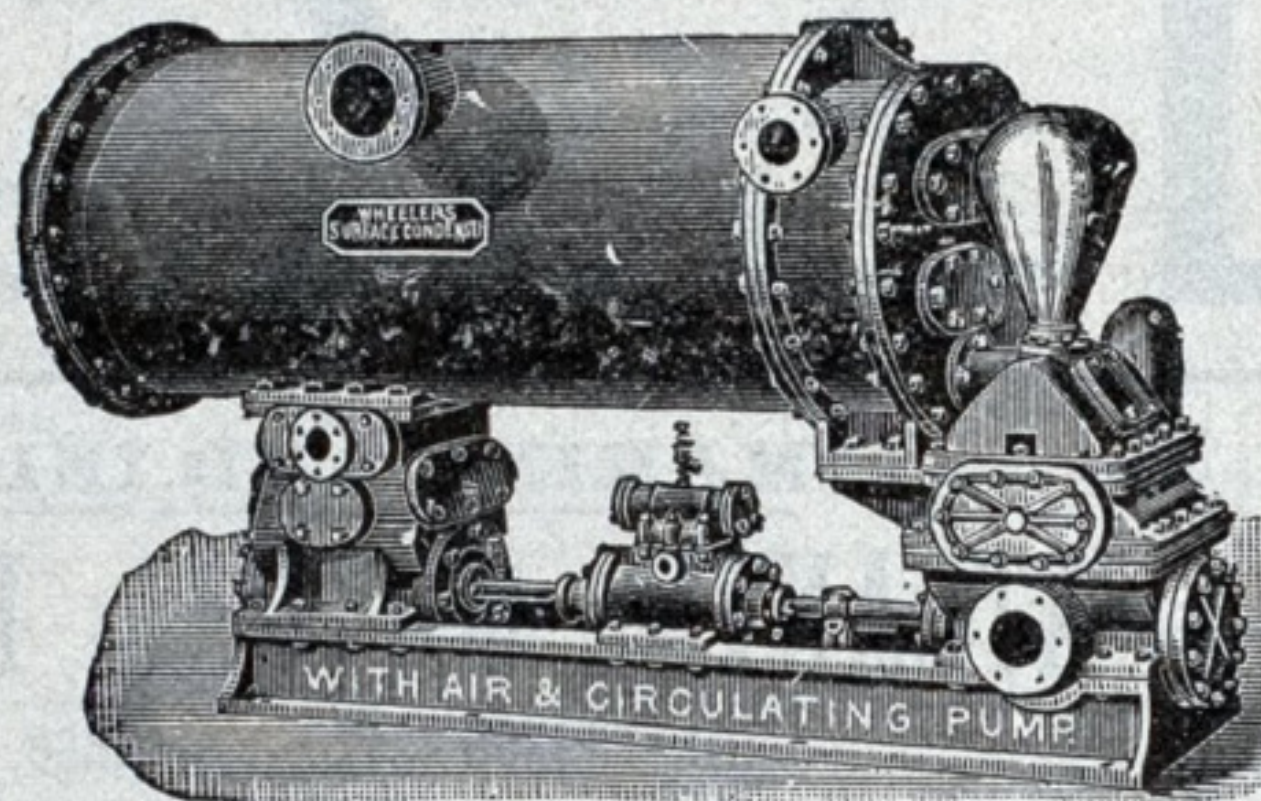
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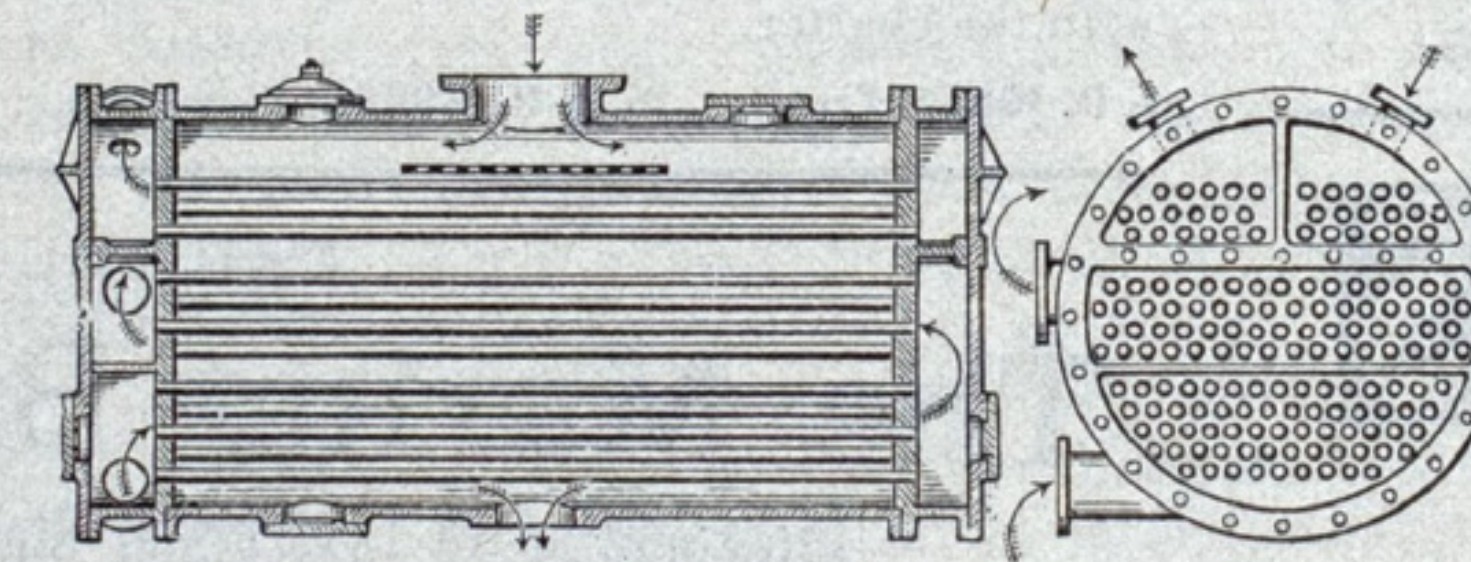
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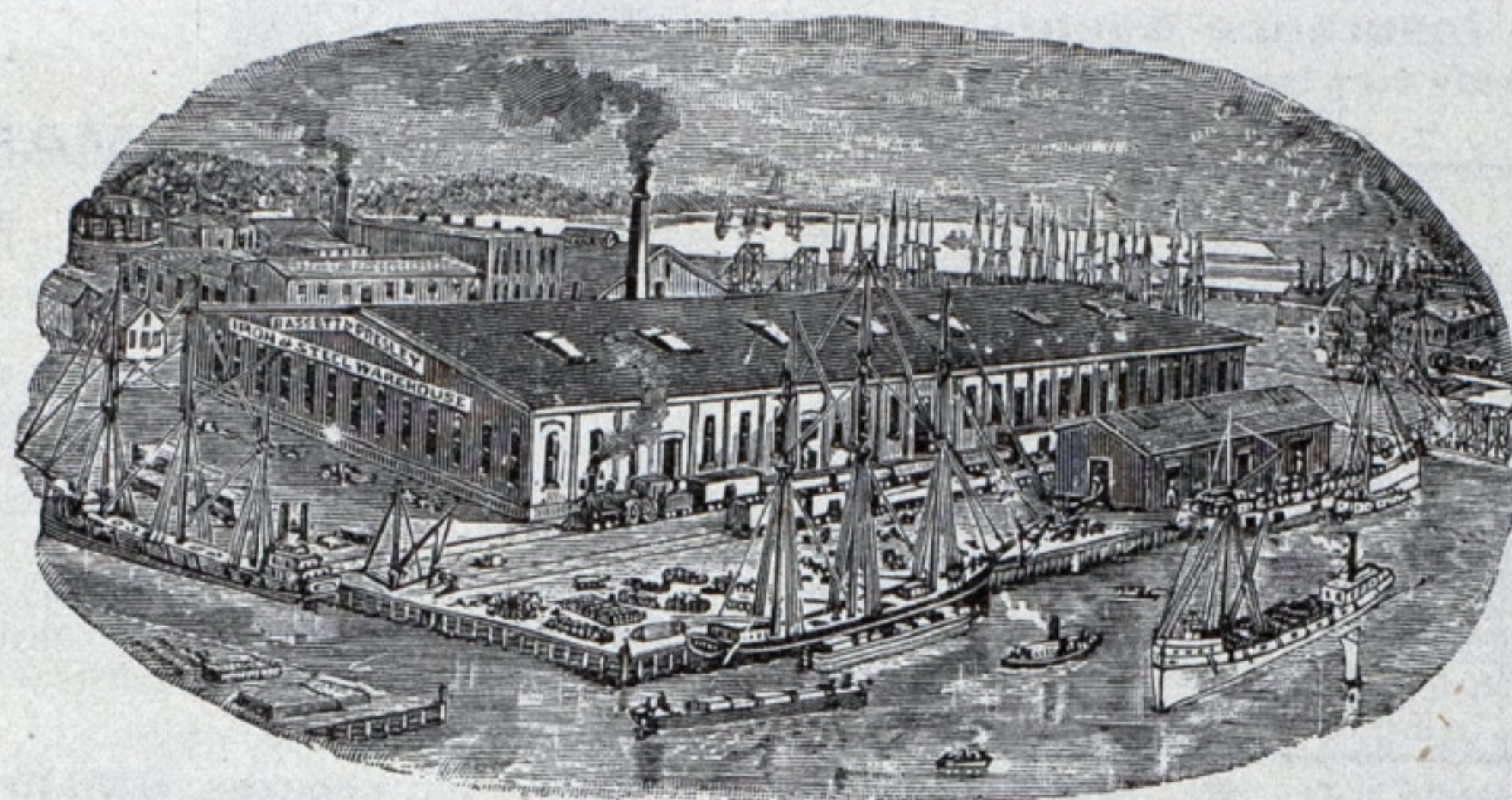
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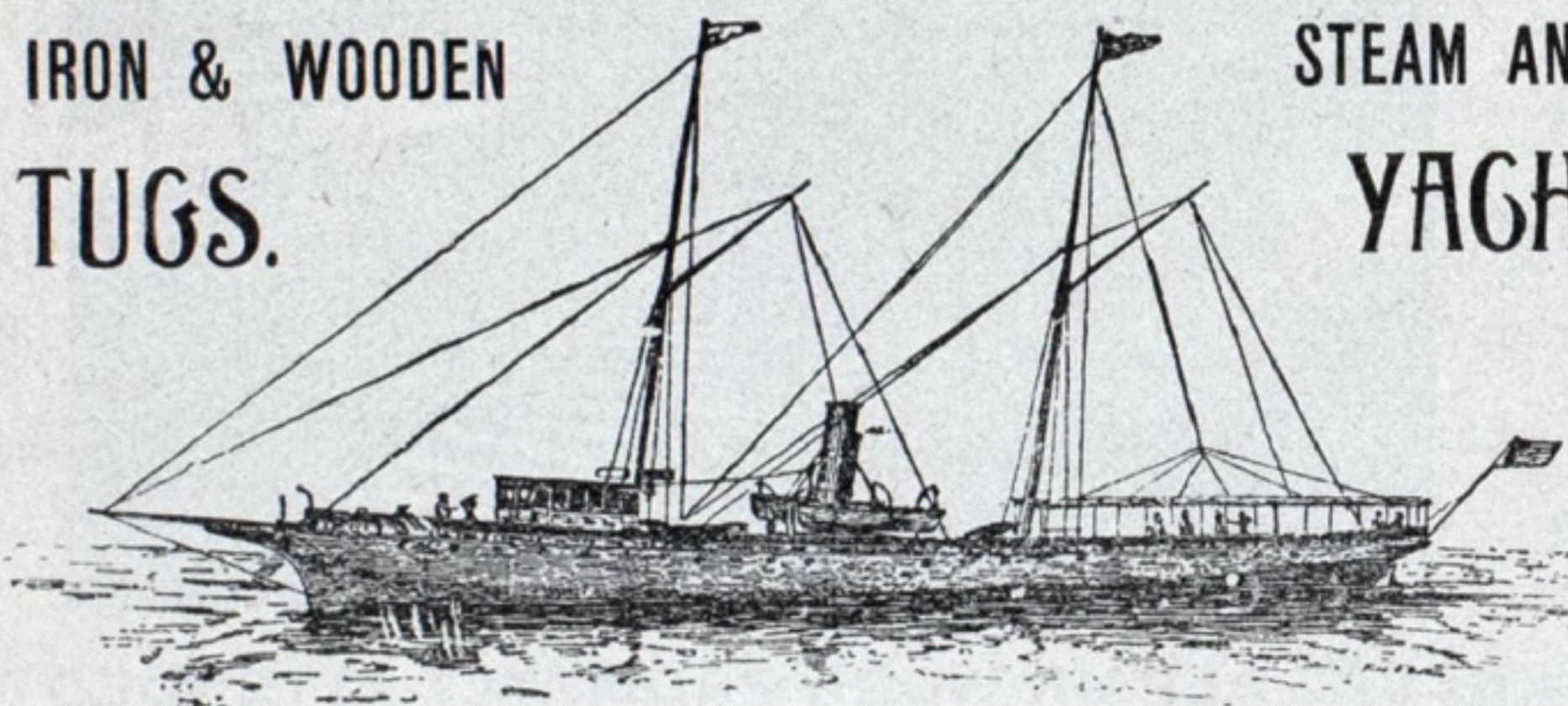
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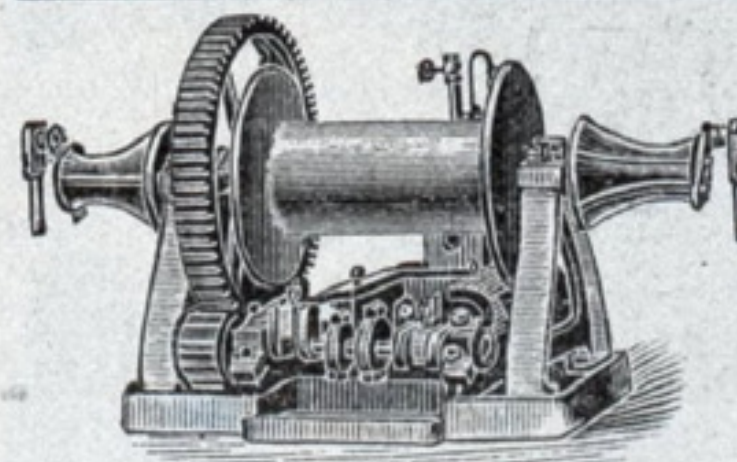
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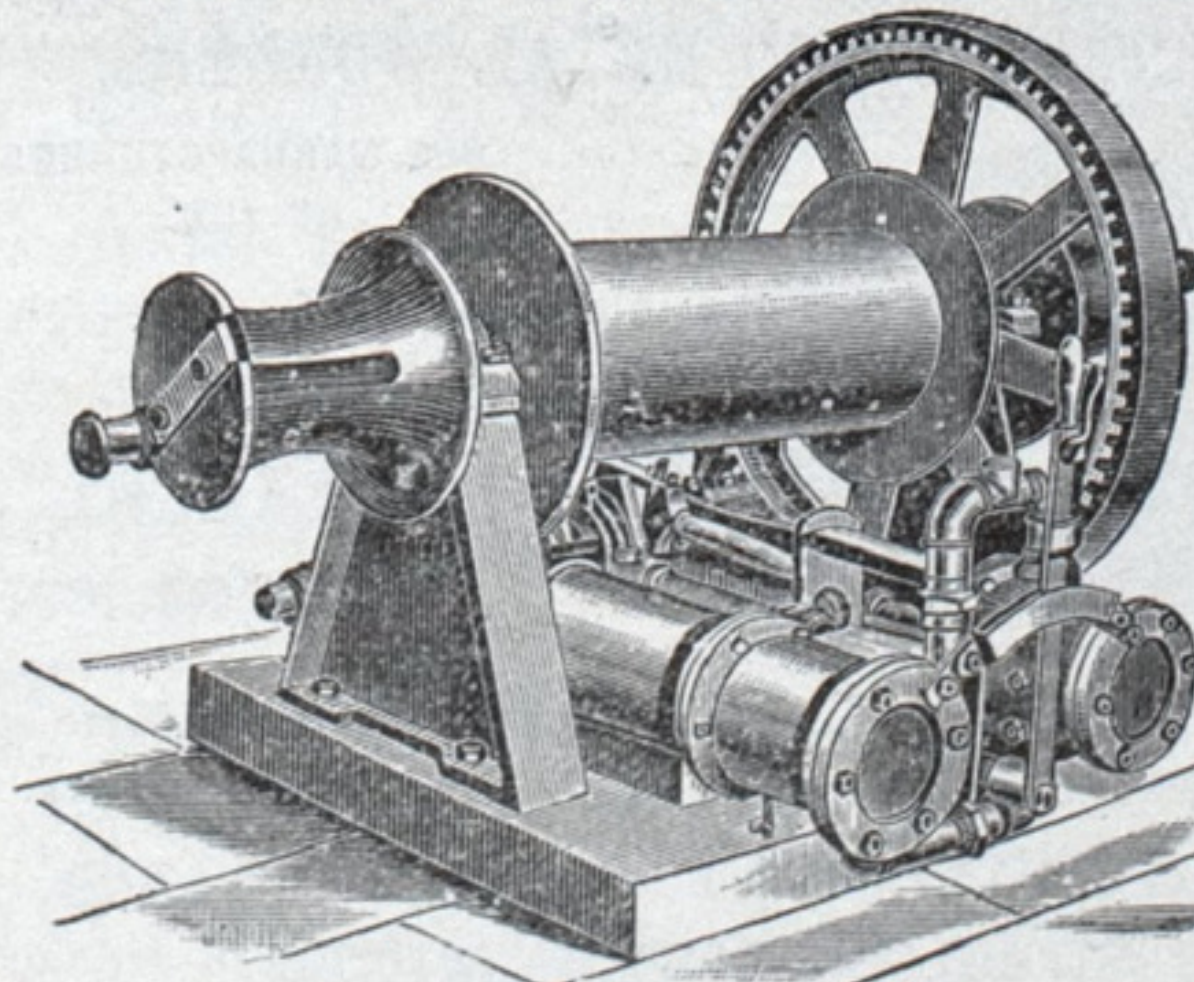
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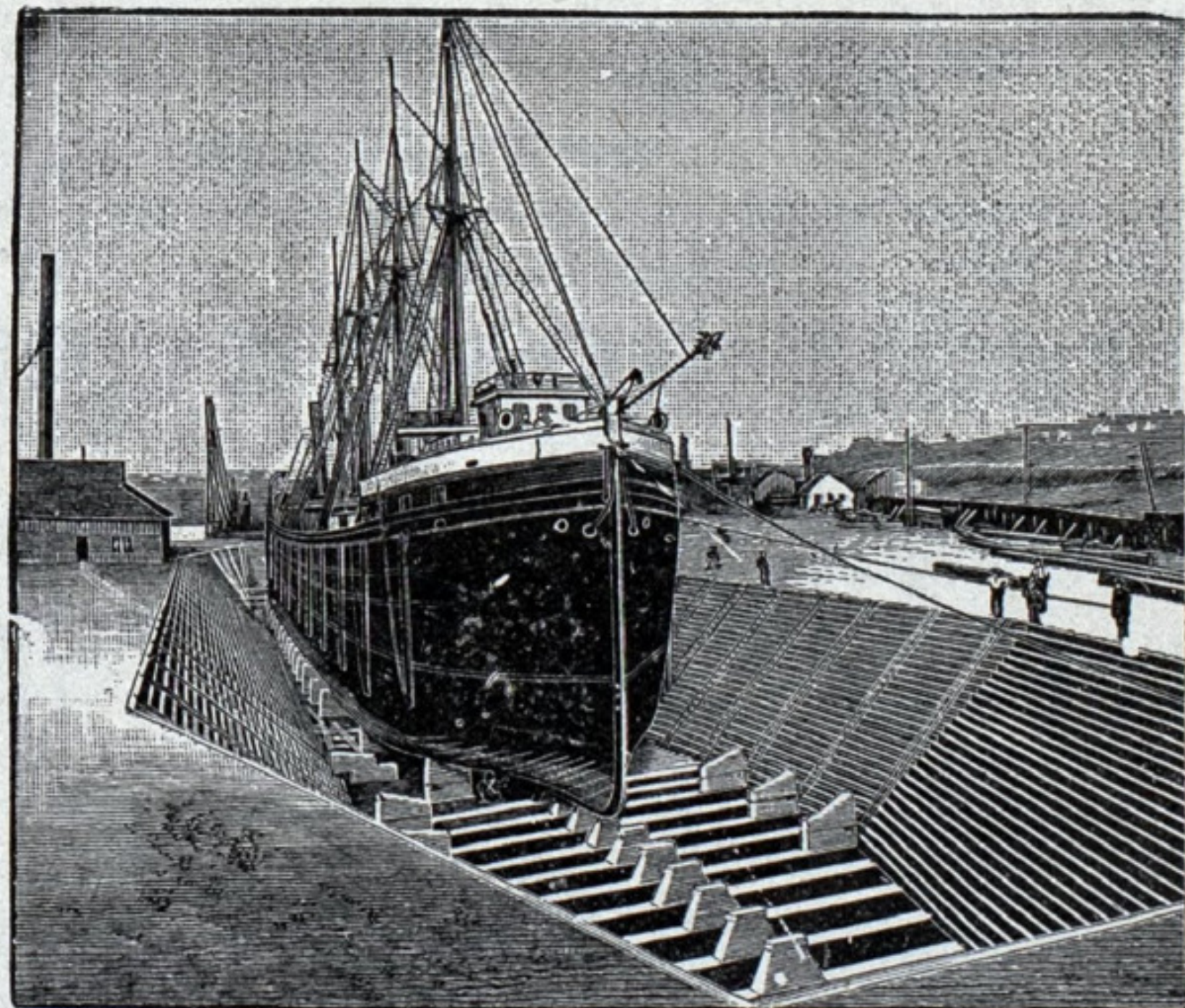
50 ft.

Depth of

Water on

Keel Blocks

16 ft.



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Keel Blocks

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Width of

Gate

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Depth of

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